WEDNESDAY, AUGUST, 25

001. Publication Committee

1:00 to 3:00 pm

11: 1109

002. Open Seminar by JSSTS: Science in Society: Responsibility of Scientists and Public for 21 Century

1:00 to 5:00 pm

13: 1323

Relationship between science and society as well as dynamic governance of the science and society relationship changes with the times; accordingly, meanings of "responsibility of scientists" or "responsibility of public" also move with the times. Just after the WWII, the "responsibility of scientists" meant responsibility of misusage of science, like atomic bombs and atomic weapons. Nowadays, since the word of responsibility comes from "response" and "ability", "response to public inquiry" becomes one of the most important points of social responsibility of scientists. In this seminar, we would like to discuss the contemporary issues on responsibility for scientists and the public. First, Reiko Kuroda, the vice-President of International Council of Science will talk about "Science in Society." Then, Helga Nowotny, the President of the European Research Council gives us wide perspectives of Science in Society and Responsibility of scientists and the public. Third, Ulrike Felt, Professor of University of Vienna, will offer a reflection on changing forms, formats and expectation from different actors when we talk about public understanding of science. Forth, David Hess, Professor of Rensselaer Polytechnic Institutes provides us his talk on social responsibility of scientists, from his accumulation of research on social movements in U.S. We hope that many people who are interested in this theme will participate in this open seminar and will be able to have fruitful discussions.

Participants:

Opening Address: President of JSSTS. *Hideto Nakajima, Tokyo Institute of Technology*

tba

Science in Society and Science for Society. *Reiko Kuroda, University of Tokyo, V.P. of International Council for Science*

Science in the 21st century is different from what it used to be, in terms of science as an academic subject and its relation to society. It adopts interdisciplinary and systemic approaches based on the findings unraveled by analytical and reductionism approaches in the previous century. It has become increasingly international, as exemplified by Human and Rice Genome Decoding programmes and international megaprojects which require gigantic equipments/stations such as the International Thermocuclear Experimental Reactor (ITER), and the Large Hadron Collider (LHC). The role of science in society has also changed. New technologies and the products now spread to our society increasingly fast and change our socio-economic structures and even our way of thinking. The world has become globalized and highly competitive. It is now a knowledge-based society, and most governments in the world urge "innovation" through scientific and technological development. At the same tine, the 21st century faces urgent global problems such as natural resources/energy depletion, loss of biodiversity, environmental deterioration, climate change, spreading epidemic, etc as well. These problems must be solved by science through international collaboration, but together with humanities and social sciences. They have to be dealt with globally as well as locally. ICSU is one of the leading organizations working to solve these problems. ICSU is a non-governmental international organization with 121 National Academic Members (representing 141 countries) such as the Royal Society, National Academy of Science and the Science Council of Japan, and 30 International Scientific Unions including IUPAC, IUPAP, IUBMB etc. ICSU's Mission is "Strengthen International Science for the Benefit of Society" and its strategy is structured around three over-lapping themes of i) International research collaboration, ii) Universality of Science, and iii) Science and policy. In 1999, ICSU organized World Conference on Science together with UNESCO and the Hungarian Academy of Science, where "Science for the 21st century - A New Commitment, Declaration on Science and the use of Scientific Knowledge" was adopted. For the first time, "science in society and science for society" was clearly stated as a role of science on top of the three traditional ones, i.e., science for knowledge, science for peace and science for development. Last year, ten years after the epoch-making Budapest meeting, a Forum was convened again to discuss along the theme of "knowledge and future". In this lecture, I shall overview the past, present and future of "science in society and science for society" based on my experience as a scientist in the filed of chemistry and biology, Vice President of ICSU, an ex-CSTP member (CSTP = Council for Science and Technology Policy, Cabinet Office, Japanese Government), and a director of Science Interpreter Training Programme of The University of Tokyo. Ref. Reiko Kuroda, Formulas for the future. Asahi Evening News, 30th June, 1996. Reiko Kuroda, "Nurturing Science"(a book in Japanese; Kagaku-wo-Hagukumu), Chuoh-ko-ron, 2002.

Science in Society: why is there no Craig Venter in Europe? *Helga Nowotny, ETH Zurich, President of European Research Council*

As a starting point I will focus on two, admittedly very different icons' of science in society of their time: Charles Darwin and Craig Venter. The comparison allows me to chart the development that science in society has taken since Darwin's time and ask the question why there is no Craig Venter in Europe. If, at least in the US context, the scientific entrepreneur" is becoming a leading figure, what other reconfigurations regarding science in society go with it? Can we speak of a scientific citizen's movement and what does it mean? Is the value of science as a public good under assault and if so, what needs to be done? Other than the US, Europe has been spared at least the massive fall-out of public debates on creationism and that instigated by climate change doubters (for an STS audience one might add the science wars' excepting the UK). Of the three major discourses in which society is engaged, if not constituted to tame scientific curiosity, Europe has had its discourse on risk, resulting in the legitimation of public participation and the precautionary principle. It remains divided in its value discourse, ranging from very liberal to extremely restrictive legislation for stem cell research and biomedicine in general. Is Europe now entering its innovation discourse, with the EU proclaiming an Innovation Union for 2020 and how might it end?

Public Understanding of What? Future challenges for imagining and practicing (techno)science-society interactions. *Ulrike Felt, University of Vienna*

While many European member states had started to put in place different programmes addressing issues of public uptake and understanding of technoscience in the late 1980s and early 1990s, the European Union explicitly entered the scene only by the late 1990s. Since then there have been numerous reports and policy statements issued, research programmes launched, science communication rewards created and concrete communication actions supported. How were these interactions between science and society imagined? Which forms and formats did they take? How were they discursively framed? What were the different expectations of the actors involved? And how did all this tie into different models of a future European knowledge society in a global context? These will be the core questions of this talk. Main issues discussed will also cover the changing visions of who would be these "European publics" to be addressed, of why people should understand technoscience, of who is supposed to communicate and actually what should be understood about science. Yet more importantly the question of how these framings of the "science and society problem" changed during the last decade, e.g. from understanding to awareness to engagement, how that impacts on the ways technoscience is integrated into contemporary societies and what future challenges are waiting in this domain will be addressed.

Social Movements, Publics, and Scientists. *David John Hess, Rensselaer Polytechnic Institute*

Increasingly the STS literature has turned to issues of public understanding of science and public engagement with science. Underlying assumptions of much current research involve a lay, individualized public. An alternative approach examines how the public is sometimes also represented through civil society organizations, including social movement organizations. This paper will explore recent literature on social movements and scientists, including the author's own research on advocacy movements in support of the reform of cancer research and of economic development policies. The goal is to bring together thinking about science and publics and about science and social movements.

Chair:
Yuko Fujigaki, University of Tokyo

003. Council Meeting
3:00 to 5:00 pm
11: 1109

004. Program Chair's Plenary: STS in Global Contexts
6:00 to 7:30 pm
13: 1323

What does holding 4S annual meeting in Asia mean for STS research worldwide? It makes people's eyes open to questions relating to universalities and cultural differences in STS concepts. We can re-consider the applicability and transmutability of Western-centered concepts. How are perspectives standing between two or more different cultures? We selected researchers who can talk on thses questions.

Participants:

WWViews: Western-centered citizen participation? *Tadashi Kobayashi, Osaka University*
tba

African Arguments:"Of course, we are all starving." *Wesley Shrum, Louisiana State University*
tba

Sociotechnical Imaginaries and Cross-Cultural Comparison. *Sheila Jasanoff, Harvard University*
tba

Chair:
Yuko Fujigaki, University of Tokyo

005. JSSTS Reception
7:30 to 9:00 pm
Faculty House: Restaurant

THURSDAY, AUGUST, 26

006. (Ex)changing the body - vital transformation and telos
9:00 to 10:30 am
12: 1212

This panel revisits the concept of exchange as an entry to medical practices. Exchange is movement through which change is produced. We wish to use the concept of exchange to open up medical practises revolving around the human body focusing on three types of exchange and the changes they induce: 1) exchange of bio-products - e.g. semen, ova, embryonic stem cells, skin and bone, 2) exchange of pharmaceutical products - e.g. pharmaceuticals and illegal psychoactive drugs, and 3) exchange of device products - e.g. prosthetic devices and implants. How does exchange of these different kinds of products interact with bodily states and perceptions of desirable aims? What are the types of vitality at stake? How is exchange structured and why? How might we conceptualise the forms of exchange taking place without reifying notions of commodification, markets, or gift economies? What might we learn from comparing different types of objects traversing body boundaries, the modes of exchange through which they travel, and the types of change they induce? By using the concept of 'exchange' as an entry point for empirically examining science-society relations, the session will help to re-think notions of bio-value, commodification and market.

Participants:

Hips as ubjects: (ex)changing the almost human. *Klaus Hoeyer, University of Copenhagen*

It is pretty common to ask "What is hip?", but not quite as common to ask "What is a hip?" This question, however, presents itself in particular ways when the hip is exchanged. Sections of bone taken from people undergoing total hip replacement are exchanged on a routine basis for transplant purposes and metal hip prostheses are exchanged for both implant and recycling purposes. I follow hip bones through bone banks and transplant surgery and talk to donors and recipients, and I follow metal devices as they enter bodies and leave them again in crematorium recycling schemes. I seek to arrive at a new position from which to contemplate what a hip is and how it - and its exchange - interacts with notions of body and self. Though generally viewed as mundane and untrendy, the everyday exchanges of hips touch upon basic social categories and fundamental questions about what is part of the self. At the point of exchange is the hip then part of a person, a subject - or a mere object, a commodity? Can it be owned and sold - or is it beyond sale? Does hip exchange form a market or is it organised according to different logics? By returning to the anthropological notion of exchange and exchange system, rather than trade and markets, and by exploring hips as ubjects, rather than subjects or objects, and by contemplating the relations between them and potential exchange partners as entitlements, rather than ownership, I present transformations and challenges produced by hip exchange.

Multiple exchanges, emergent ethics, responsive clinical research. *Marsha Rosengarten, Goldsmiths, University of London*

This paper begins with the observation that despite evidence to suggest that clinical trials involve multiple exchanges—e.g. between bodies and numbers, drugs and side effects, medical monitoring and health outcomes -the terrain of bioethics focuses on one particular relation: the potential for exploitation by those conducting or aiding the carrying out of science in their enlisting of an experimental population. The focus presumes and, in doing so, enacts the remainder of the field as ethically inert. Using the example of 'offshore' HIV biomedical prevention trials, I illustrate how the concern about untoward scientific acts and effects can be supplemented by an emphasis on exchanges currently deemed extraneous to ethics. Drawing on recent methodological developments in STS, I demonstrate ethics as an emergent property in the exchanges of clinical trials. The shift from a transcendent to immanent concept of ethics is proposed as a methodological device for aiding the development of outcomes/products more responsive to local contingencies.

The Lost Hau: Exchanging and Embodying '(Im)pure Gifts' of Human Embryonic Stem Cells (hECS) in India. *Aditya Bharadawaj, Edinburgh University, School of Social and Political Science*

The paper revisits Marcel Mauss' notion of Hau - or the embedded spirit in/of the gift demanding exchange - to reinterpret the figure of the human embryo donor as 'lost'. Both donor and the embryo, it is argued, get lost in the circuits of exchange between scientists (purging human embryos of their cellular cargo), clinicians (circulating the purged cargo) and patients (embodying the cellular form). Drawing on a larger multi-sited ethnography the paper will show how this exchange is not only global - involving 'global citizens' from over 22 countries traveling to India in pursuit of hESCs - but also how the global bioethical and scientific discourse on 'gifting' human embryos for research conceals: (1) an 'impure gift', (2) fears of 'impure materiality' of embryonic cells and (3) counterclaims of 'impure science'. In the final analysis the paper resurrects the spectral presence of the 'lost donor' - the reified 'gifter' - as the lost hau that haunts the global politics of hESC exchange and its socio-scientific consequences.

Exchanging 'good' life - motility, pedigree and stock in a Chinese sperm bank. *Ayo Wahlberg, University of*

Copenhagen, Anthropology

Sperm cells are both transferable and transformative. Their exchange depends on their vitality and hence their exchangeability must be achieved. This paper tracks multiple forms of assessing vitality related to sperm donation in a Chinese sperm bank. In doing so it shows how semen quality, donor pedigree and population stock converge in exchanges of sperm. Much more than a brokered (commercial) transaction between donor and recipients, I will argue that sperm exchange can be helpfully understood as a prestation of 'good' life. When donated sperm samples are peered at through a microscope in order to grade and classify them, they are invested through and through by a multiplicity of forms of life (social and biological, individual and collective, cellular and psychological, genetic and morphological, genomic and demographic). Whether such samples are 'good' (i.e. exchangeable) depends on normative estimations of their vitality made practicable by concepts of quality - biological quality, donor quality and population quality - which inform and organize donor sperm criteria and screening processes. It is through the grading of quality that 'good' life is assured for recipient couples.

007. Green Building

9:00 to 10:30 am

12: 1213

Participants:

A Comparative Study of the Evolution of Energy-Efficient Building Technologies: Comparison among Europe, the United States and Japan. *Naoki Takuma, Tokyo Institute of Technology*; *Hideto Nakajima, Tokyo Institute of Technology*; *Naoki Yamano, Tokyo Institute of Technology*; *Katsunori Hanamura, Tokyo Institute of Technology*

Introduction It is essential to decrease the amount of energy consumption to cope with fundamental environmental issues, such as the depletion of energy resources and the global climate changes. Although the general importance of energy-saving technology is well accepted, the concrete solutions usually confront negative reactions. In order to observe what kind of events promote or impede the development of energy-saving technology, we focus on the energy-efficient building technology. We do so for two reasons. First, in many advanced countries, the reduction of energy consumption within buildings are quite significant, because it occupies a substantial portion of the national energy consumption. Secondly, the development of energy-efficient building technology involves variety of factors, such as social, historical, psychological and natural factors, thus the result may have strong explanation capability. Methodology In order to obtain the latest information of energy-efficient building technologies, we made in-depth interviews with the experts in research organizations in each country or region. The research organizations we visited include the Austrian Academy of Science, the Passive House Institute Darmstadt, Lund University, Florida Solar Energy Center, the Rocky Mountain Institute, and several Japanese institutes. We also made document-based research to supplement the interview results. Results We found five major factors that influence the evolution of energy-efficient building technologies. First, compulsory regulations promote the adoption of energy-efficient building technologies, as can be seen in Germany, Austria and Sweden. Secondly, there are historical path-dependencies. For example, the Austrian government has to improve housing supply for workers in1920s. Consequently, many houses are in the second refurbishment period and have best opportunity to increase their energy-efficiency. The third factor is the difficulty of design with climates. Energy-efficient buildings must meet local climate conditions. In many cities of Japan, hot humid summer and relatively cold winter require sophisticated design. On the contrary, strategies are quite simple in north and central Europe despite severe winter. The occupants' comfort is the fourth factor. Occupants were guinea pigs and researchers did not care for their comfort in many projects in the United States. In contrast, occupants' comfort comes first in the Passive House Standard, which is one of the most efficient technical standards in Europe. Finally, the characteristics of experts' community are quite influential. We can see an example of the German architects' community. It was conservative and exclusive. In 1980s, it opposed the adoption low-energy buildings and hindered their diffuse. Implications An energy-efficient building technology does not evolve by itself. It evolves in parallel with variety of factors. The difficulty in design with climates suggests that, in some cases, the problem cannot be solved by a technical package. In that case, occupants are requested to define the comfort, or, in broader sense, define a technology. Depicting the evolution of energy-efficient building technology enables us a wider interpretation of technology.

Assessment of Solid Waste Management in Ecovillages. *Jose Cristhian Veizaga Bellido, The Univesity of Tokyo*

The inadequate management of solid waste causes environmental and social problems that can be minimized by realizing sustainable practices in communities. In Japan, some communities are taking active role in efforts to achieve sustainability on regional scale. In Shizuoka-Japan, a community called Konohana Family is challenging to be a sustainable community, where 56 members live together as a big family; and an ecovillage approach is followed. Ecovillage principles aim to combine social-cultural environment with a low-impact lifestyle. During July, 2009, the preliminary diagnostic and management of solid wastes in Konohana ecovillage were evaluated. Based on findings obtained into this first survey, the second field work was conducted in January, 2010; where the characterization method of solid wastes was conducted, and also questionnaires survey was conducted. In the Konohana ecovillage, the historical background, the community inspiration, and their daily life were reviewed. According to Konohana members, this community was intentionally funded in 1993, as an organic agricultural community who has inspired in achieving a deep human connection to nature, until they started to grasp ecovillage principles leaned from the Ecovillage Design Education Program promoted by the Global Ecovillage Network. However, visual inspection showed four strengths: the social is health and healing; the economic is right livelihood; the ecological is the organic food production; and the worldview is spiritual. However, specific research topics, such as solid waste management, were not conducted yet. Thus, this research studies if Konohana Family achieves a sustainable solid waste management by following ecovillage principles. In this way, quantitative results shows that 69% are organic wastes, paper 4%, cardboard 7%, textiles 5%, rigid plastic 6%, rubber 0.4%, plastic bags 0.4%, metals 0.3% and 8% others. Organic wastes are completely recycled. Regarding to inorganic wastes, the community is not only dealing with reduce their solid wastes generation, but also they have assumed the challenge of reducing neighbors' wastes by accepting donated materials like: clothes, toys, dishes, and so on; and then, these materials are being mainly reused. Members' priority regarding solid waste management is evidently reused; even future plans consider the option of implementing a Green Clothing Boutique to promote local actions to reduce wastes. When questions related to Konohana's essence to follow a sustainable way of living was asked, a strong spiritual base was commonly noted among its members. In view of the general conditions of solid wastes at Konohana ecovillage, it is possible that their members are addressing sustainability. Nevertheless, to identify its achievement regarding to solid wastes management a comparison with a Japanese community such as Kamikatsu, located in Tokushima, who has demonstrated success by separating wastes into 34 types. Although the solid waste management in Konohana is not much recycled, but instead mainly reused, it shows different ways for addressing sustainability itself. In conclusion, the solid waste management in ecovillages is being conceived according to a strong sustainable vision, minimizing possible social and environmental impacts. However, in Konohana Family, long-term studies are necessary to monitor the sustainability already achieved.

Energy discourses in Swedish households. *Per Gyberg, Linköping university*

The politics and responsibility for the environment have to a large extent been transferred from an aggregated level of international- or national politics (like for instance the ozonosphere and acidification with related action plans) to the world of everyday life (Bauman, 2001). Furthermore, individualization has occurred in relation to managing responsibility (Beck, 1996, Skill, 2006, Macnaghten & Urry, 1998 and Anshelm & Hedrén, 1998:14). This tendency can also be traced through different national and international policy documents like Our Common Future (1987), the Rio Declaration (1992) and IPCC 2007, where the citizens are given a crucial role in the turn towards more sustainable development. In Sweden - and elsewhere - energy has become an important arena for this turn (Gyberg & Palm, 2009). When studying different practices where energy is handled, it soon becomes clear that there are mainly two strong discourses relating to energy in Sweden (Gyberg, 2003, Palm, 2004, Kaijser, et al, 1988). One is the supply discourse which aims to solve environmental problems, risks, or other issues by comparing different energy sources. The other discourse concerns efficiency and a more efficient way of living. The efficiency discourse has quite a different way of interpreting problems concerning energy compared to the supply discourse. The energy consumption of households represents one third of Sweden's total energy use (Energiläget, 2007). Considering the fact that citizens are being given an increasingly crucial role, it is of great interest to study how householders understand and relate to this responsibility. The purpose with this study is to investigate energy as an area of knowledge in the households. Important questions are: -How do the households relate to energy, and is it possible to distinguish any fundamental features? -How is the area of knowledge organized, and how is the diversity of the energy concept dealt with? -How is responsibility handled? The study is based on interviews with householders of different ages living in different types of dwellings. Discourse analysis has been used to interpret the interviews. Discourses objectify various phenomena, or "objects", via social and historical continuity (Foucault, 2002/1966, p. 264-270) that create certain "regimes" and certain "effects" of truth (Foucault, 1990/1976 and Walkerdine, 1984). In this paper, discourse is defined as rule-governed meaning formations surrounding a given object (Foucault, 2002; Gyberg & Lee, 2009). The interviews have shown that there are mainly three different discourses that can be identified in the households. I call them "path of least resistance", "efficiency and savings" and "the green dream". They vary in four main ways, concerning responsibility, activity, trust, and the role of technology. These variations lead to different ways of defining what the problems are, and also result in different solutions to the problems.

008. Energy Markets

9:00 to 10:30 am

12: 1214

Participants:

Economic analysis and distributive struggle: "stranded costs" in deregulating the U.S. electrical power industry. *Daniel Breslau, Virginia Tech*

When electricity markets are deregulated, some power plants that received guaranteed recovery of costs under regulation are no longer competitive. The amounts that they are no longer able to recover are known as "stranded costs." Invariably, a struggle ensues among utilities, consumer groups, and governments, over who should bear responsibility for these "stranded costs," and therefore who should shoulder the costs themselves. This paper examines the struggle over recovery of stranded costs during the process of deregulation in the United States from the late 1980s to the present. Tracking academic literature, state-level and federal-level regulatory proceedings, it finds that economic models and analyses were embedded in the terms of the deregulated market in a way that allowed this struggle to be reframed in terms of economic efficiency. What was viewed by consumer groups as a "bailout" of the electric power industry was therefore reframed as a public cost for the inefficiencies of the regulated regime when compared to a competitive market.

Enacting a market: how consumers relate to a free market for electricity. *Henrik Karlstrøm, Norwegian University of Science and Technology*

The Norwegian market for electricity is completely deregulated and allows consumers to freely choose their supplier of electricity. Conventional economic theory postulates that consumers will actively exploit price differences and thus drive efficient competition between electricity utilities. However, research shows that most consumers are not particularly active users of the possibilities offered by free competition in the electricity market. To the degree that they switch between suppliers, this has usually more to do with other factors than the price of electricity, such as moving. However, some consumers do engage with the options made by a deregulated market. Such observations raise interesting questions regarding how consumers actually relate to the market for electricity. What kinds of consumers participate actively in the market? Do factors such as geographical location, age, education or income play a role in how people approach the issue of choosing their electricity supplier? What barriers are there for people to take advantage of price differences? Can electricity be seen as just a good to be traded like any other, or is there some special facet to it that makes electricity something more than just a question of optimum price of supply? Previous research on the "invisibility" of electricity points in this direction. Using data from a statistically representative telephone survey about consumer preferences, I analyse responses about opinions on the free market for electricity and eventual actions people take in the electricity market. I look at the factors mentioned above in relation to the answers from the survey. The quantitative data is combined with in-depth focus group interviews to substantiate the findings. The findings will shed light on how consumers' market actions may be understood as well as on some larger issues regarding the way people relate to everyday technologies. When the most important aspect of electricity is that it is there, in your walls when you need it, how much thought is given to where it comes from?

Implementing marginal cost pricing. *Mats Bladh, Linköping University*

This paper studies the origin of the idea of marginal cost pricing and its implementation in the electricity supply industry in Sweden. In short, the paper argues that marginal cost pricing had an autonomous origin in the practical task of optimizing a power system. Pricing was a central issue and became increasingly sensitive to marginal thinking. In the 1970s this fused with economist's ideas of marginal cost pricing where the self-balancing market is the foundation. This contributed to a halt in power investment in the 1980s and eventually to deregulation in the 1990s. At the most general level it is about the relation between economic theory and the object of that same economic theory. Economics is objectivistic in the sense that it cannot handle the implementation of economic theory into the reality the theory tries to understand. This study also addresses the possibility of a flow from the economy to economist's ideas formalised by French "ingénieurs-économistes". The history of the theory of marginal cost pricing (MCP) show a close association with engineers and practical problems concerning public works and public utilities. When Hotelling (1938) wrote his article he revived the ideas of Jules Dupuit, a French engineer who wrote "On the measurement of the utility of public works" already in 1844, a publication used by Alfred Marshall. However, the debate on MCP and its implementation took off after World War II, and here engineering-economists of the newly nationalized Électricité de France were at the forefront: Massé, Allais, Dessus, Boiteux. As Drèze has pointed out the members of this school belonged " to the staffs of the engineering schools or statistics departments, to the research as well as the

executive divisions of nationalized industries, or to the administration, but not to the staffs of economics department or economic research institutes." The point with this is that even if these authors were knowledgeable of economic theory, they were involved in more practical matters of pricing in specific industries. The mathematical bend of these engineer-economists made their studies respectable in the eyes of pure economists, so that The Journal of Business in 1960 had an article by Boiteux, "Peak-load pricing", from 1949 translated from the French. This is understandable when we consider that economics has had the natural sciences, especially physics, as the model science, see Mirowski (1989) and Arthur (1994:xi). Mainstream economics is thus susceptible to engineering sciences, and engineers deal with economical issues such as pricing. If this study is right "performativity" may be rephrased in Polanyian terms as the embedding of neoclassical market in the actual market, thus avoiding reducing the latter to economics.

Numbers of Profitability - In Search of Calculation. *Trine Pallesen, Copenhagen Business School, Department of Organization*

Wind power has become one among many proposed 'answers' to climate changes. However, the organisation of this renewable energy technology, as well as the arrangement of the exchange relations of the renewable electricity produced on the turbines, defines how, and if, this energy technology may become part of the solution to global warming. Though it seems paradoxical that the 'arrangement' economists and policy makers in the European countries seem to rely on, to make wind power emerge as an 'economical' alternative to conventional energy technologies, is the exact same mechanism which is accused of failing to consider the global climate, namely the deregulated market (an argument made widely accepted by Nicholas Stern). Whereas the market fails to account for co2-emmissions of traditional energy technologies, wind power is still considered an immature and inefficient technology, unable to compete with traditional energy forms, such as nuclear power or coal-based thermal power. But the configurations allowing one technology to emerge as 'more efficient' than others are not, however, the analytical emphasis of this paper. Rather the proposed paper investigates one governance model, namely the feed-in tariff, as it unfolds in France. Devices such as feed-in tariffs (or tender-systems) are the typical devices designed to enable the emergence of wind power, i.e. their aim are that of equipping the wind power technology to become 'competitive' in the market (by means of subvention). In France, and elsewhere, the feed-in tariff has been discussed mainly along two dimensions: efficiency measured as the number of installed wind turbines, and secondly as the 'market-likeness' of the device. The point of departure in the paper is that the feed-in-tariff performs the role of a market device, i.e. the material and discursive assemblages intervening in the construction of markets (Callon, Muniesa and Millo 2007). In the paper, the feed-in tariff is used as a point of entry to the making of the French wind power market. The contribution of the paper is an empirical investigation of the econimzation and politization of wind power markets through the construction of the feed-in tariff. On the one hand, the tariff is translated into a number symbolizing profitability, an act rendering wind power a well configured and calculable object made comparable to other technologies. On the other hand, the feed-in tariff is discussed along lines of 'market-likeness' and opposed to other governance models such as certificates-markets. This process is highly politicized, opening debates regarding the market as the provider of optimal distribution, as claimed by neo-classical theory. It is the general assumption that both economization and politicization are part of market-making, and the proposed paper presents an empirical illustration of these processes as they take part in the making of the French wind power market.

009. Looping Temporalities(1)

9:00 to 10:30 am

12: 1222

Inviting methodological and theoretical risks, this double panel attends to the exertion of temporalities on late-twentieth century and contemporary technoscience. Its premise is that temporality is not only multiple across domains of activity, but also looping as it tacks through operations both forward and backward. The papers in this double panel ask how temporalities are diversely modulated and recursively related tempos, and attempt to refuse time as the unmarked directional backdrop to knowledge-in-the-making. Mixing together historical, ethnographical, theoretical and aesthetic modes, this panel addresses a set of related themes. First, we take up questions of looping , tacking, and travel between temporalities that bring the past into the present, and the future in the past, as with practices of data retrieval, memory, forgetting, archiving, forecasting, investment, retroaction, and speculation. Second, the papers explore the affective dimensions of temporalities in terms of time felt, passed through, attaching, anticipated, nostalgic, abandoned, made mobile, imagined, and moving. Third, the panelists collectively offer a performance of disjointed time by following temporal multiplicities as humans encounter the tempos of plant movement, pharmaceutical durations, architectural remnants, and finance capital. How does the pace of experiments, manufacturing, organism development meet the speeds and slownesses of governmentalities in the form of logjams, vestigial classification systems, and deadlines. What are the practices that generate, choreograph, anticipate, disrupt, or even erase the encounter of different temporalities within technoscientific practices -- and to what ends? Inviting the likes of Bergson, Deleuze, and Benjamin to join in our conversations, the panel aspires to be wary of treating time as merely a unidirectional, measured, and abstract force, and to remain open to the untimely within our own inquiry.

Participants:

The Scanning Eye: Cybernetics, Temporality, and Perception in the Post-War Image. *Orit Halpern, New School for Social Research*

This paper examines the relationship between the image, time, technology, and knowledge after the Second World War. One site to investigate these changes in representation is at the intersection of science, art, film and architecture in the design practice of Charles and Ray Eames and Gyorgy Kepes. In these works, including many science education and pedagogy films, displays for the United States Government, and marketing campaigns for IBM and other corporations, we witness the emergence of new forms of affective interaction, and a historical transformation in the organization of sense and perception. All of these designers were deeply invested in the emergent terms of cybernetics, neuro and cognitive science, communication science, and electronic media. Ontology, documentation, and representation seemingly replaced by discourses of information, performance, process, and modularity. They envisioned the world as an interface for the mediation of on-going, lively communicative exchanges. These sites, therefore, offer us a place to excavate new attitudes to time and the image. These spectacles, producing virtual avatars of a not yet existing future world, developed practices of "interactivity" and re-conceptualized vision as a material, and temporalized process, amenable to technical replication. Most importantly, perhaps, as projects deeply embedded within the logistics of Cold War education, information marketing, and political spectacle, these architectures of perception offer us tools to reconsider models of governmentality, individuation, and subjectivization. In these works no map, model, or screen is an object, rather it is a temporalized interface, a conduit for future processes. This is an "anticipatory" design, in the words of Kepes. A design that does not serve the present, but the future; training spectators and designers in emerging modalities of anticipation, interaction, and information closely correlated to the novel communication machines and economies of the time.

Retrieval, Potential, Growth: Family Planning to Human Capital. *Michelle Murphy, University of Toronto*

TBA

Moved by Moving Images: Temporal Looping in Labs and 3D CAVES. *Joseph Dumit, UC Davis*; *Natasha Myers, York University*

Based on fieldwork with live-cell imaging biologists and 3D immersive CAVES geologists, this paper analyzes how researchers engage with moving images, how moving images as raw data move them, and often how those same moving images don't move others and difficult translation is needed. I provide a preliminary account of what it means to think of these videos and immersions as "raw data" and what might be called a phenomenological account of how researchers engage this data and turn it into research. In each case, this involves fits and starts, pausing and pondering the temporal nature of this engagement. Following Susan Kozel's artistic-theoretical engagement with media technologies, and using Deleuze's definition of "Virtual [as] not something that lacks reality, but something that is engaged in a process of actualization" we can start thinking of this mode of attention as creative. This mode or mood of what a researcher called "going the next level in" literally draws out an actual from what is now seen to have been virtually there. This seeing-drawing-out action, is one of "introducing difference into the very idea of sensation," or "immanence." One sees more than one saw before, one is not simply learning to see, but inventing a mode of seeing. A layer to be unpacked concerns narrative responsivity: for a scientist studying a video, a story emerges out of possible stories, with named actors and actions. One of the stories solidifies through a positive feedforward cycle in which the narrative affects the seeing and each deepens the other rather than challenging it. Attention becomes relatively fixed, as if one now knows what to look at and what to look for. This feedforward cycle is what we (after Hacking) might call "experimental looping." And most crucially, this process allows for an escape from exploration. Through suggesting interventions and quantifications, it suggests a series of experiments that would turn the process into papers. Another scientist explained, "The give and take, back and forth between you and the data that suggests what to do next in the experiment." A temporal slice into what Rheinberger calls experimental systems.

Chair:

Cori Hayden, University of California, Berkeley

010. Co-Evolution of Technology and Institutions for Sustainability Innovation

9:00 to 10:30 am

12: 1232

In the era of knowledge-based societies, rapid knowledge creation and easy access to knowledge bases are considered to make key contributions to innovation. Particularly for making steady steps toward sustainability, it is crucial to implement innovation by integrating diverse fields of science and technology. Because scientific and technological progress is developing rapidly and the sources of knowledge are widely distributed in the field of sustainability, no single organization has all the necessary capacities to stay on top of all the various areas, and collaboration across organizational boundaries has become of critical importance. Collaboration between academia and society, however, is not always working effectively, because of various technical, economic, and organizational challenges, including establishment of academic approaches to trans-disciplinary research, its institutionalization, and coordination of seeds in science and needs in society. This session addresses a key question of how technology and institutions co-evolve, creating, diffusing, and utilizing scientific and technological knowledge for sustainability innovation. Experiences in Asia, Africa, and Latin America will be shared and examined for effective actions in the future. The structure, functions, and evolution of collaboration between academia and society will be discussed, drawing implications for public policy, corporate strategy, and institutional design for bringing forth sustainability innovation.

Participants:

Sharing and shaping perceptions: Dialogues with expertise in participatory design of renewable energy technologies. *Carla Alvial Palavicino, University of Tokyo*; *Masaru Yarime, University of Tokyo*

Energy production is profoundly rooted in the way industrial society has been shaped. Any transition to a sustainable energy system would not only require technological upgrades, but also societal and cultural transformations in the way we understand energy. Notions about energy vary among different groups. While among experts and decision makers the notions of energy serving economic development are mainstream, lay people's perception of electricity derives from their daily life. These perceptions differ according to the history, social relations, culture, and can be strikingly different among those who have rarely seen electricity as means for "production" but rather as a mean to satisfy social norms of "comfort and leisure" of modernity. The deployment of community based renewable energy projects necessarily confronts these visions, along with concepts of efficiency, risk, locality, resources and development. While experience has shown that "bottom-up" approaches are more likely to succeed, "top-down" approaches are the most common; however, there are also intermediate "mesogenic" cases where science fulfills its role in aligning with the needs of society, and where the attitude of experts (developers or researches) towards the community will define how deliberative the instances of design and decision making will be. Here we present an ongoing case study of a "virtual power plant" implementation in a rural community in Chile, developed by engineers of a national university. This community exists because of its cultural and historical value, yet modernity and progress have only touched it until recent years. Electricity is a newly introduced but scarce resource, although not traded as a commodity. Using concepts of STS and public participation, this research is aimed to explore what are the different perceptions of electricity, how they have been constructed, its confrontation and shaping to satisfy the need of multiple stakeholder, addressing issues of expertise, power and participation.

The Accretion of Microfinance for Innovative Urban Sustainability: Opportunities and Challenges of slums growth in Sub-Saharan Africa. *Emmanuel Musau Mutisya, The University of Tokyo*; *Masaru Yarime, University of Tokyo*

The existing urban dynamics, organizational political complexities, bureaucratic typologies and structural interference are major issues undermining sustainable urban development in Sub-Saharan Africa today. These factors which form the bases of implementation of policies have played a major role in neglecting poor urban areas while developing areas inhabited by high-end citizens thus leading to a continuous rapid increase and growth of slums. These challenges form the motivation behind my research. I will use this research to contribute to other researches done on this subject. In addition, I will go through previous literature on sustainability science across the world divide, and on innovative urban sustainability in Sub-Saharan African countries. This paper will also expose the challenges of rapid urbanization with a keen focus on slums. In addition, I will outline the opportunities and gains urban areas in Sub-Saharan Africa have achieved in contemporary history. Furthermore, I will put across the challenges and problems urbanization has posed to this region. On the same note, I will build on these challenges and opportunities to come up with mechanisms to help grow towards achieving sustainable urban development in the region. In addition, the paper will outline the role of microfinance services in urban areas. It will show the importance of accretion of microfinance for innovative urban sustainability. More so, it will support the idea that for overall sustainable development by use of microfinance services, microfinance sustainability is of paramount importance since the current situation of accretion of microfinance in Africa lacks sustainability. This explains why many of the microfinance institutions have failed to remain active long enough to alleviate the society's high poverty level. This paper will set out policy recommendations to both government and non-governmental players on the importance of microfinance for a better innovative sustainable urban growth. My expectation is to contribute to policies through this research that will help in building more sustainable urban centers in Africa. Of special importance is the relevance of my research to social welfare of slum dwellers. My research will show the gains

of innovative urban sustainability as a driving force in alleviating slums in urban Africa. This paper will focus on the importance of microfinance in providing clean water and sanitation, cheap housing, health services, and waste disposal services provided by groups who get loans from microfinance institutions. The target will be to create awareness to all stakeholders on the benefits of working as a team in establishing innovative urban sustainable development through empowering the poor as we embark to achieve the Millennium Development Goals and beyond.

Innovation System on Membrane Bioreactor (MBR) for Wastewater Treatment in China. *Qing Xu, University of Tokyo*; *Masaru Yarime, University of Tokyo*

The progress of constructing sewage treatment facilities in township and rural area lags behind, which has become one of the main reasons for water pollution in China. Due to the 10th "5 year Plan" , the rate of sewage treatment in urban areas has risen to 52% while there is nearly zero sanitary sewage processing ratio in the rural area which occupies the national total area 57.6% of China. The decentralized processing technology has been already applied in various countries maturely, for example, the US has 25% population using decentralized sewage treatment facility, and in Japan Jokaso technique served around 9% of total population according to information in 2005. Therefore, decentralized wastewater treatment system serves as a promising alternative measure for water pollution control and it is a necessity for public health and sustainable development in the rural areas. The membrane bioreactor (MBR) is particularly regarded as one prospective suitable technology for wastewater system implementation. This study firstly aims at analyzing the necessity and feasibility of decentralized system based on membrane bioreactors in term of sustainability; then tries to discuss the applicability and gives category proposal under different conditions based on the comparison and analysis of technologies being used; finally refers to elements of management in spreading environmental technology as a framework, discusses laws and regulations, government regulation, social acceptance involving the cooperation with the stakeholders and local government when promoting decentralized treatment systems from specific region to nationwide. Analysis about the technology innovations system (TIS) of MBR in China will be conducted. Scenarios of further development of MBR's innovation system will be analyzed in terms of different scales of service area.

Transition in Knowledge Circulation Systems in Sustainability Innovation. *Masaru Yarime, University of Tokyo*

To ensure steady progress towards sustainability, it is of critical importance to establish academic as well as institutional frameworks for making appropriate use of knowledge to encourage innovations. To understand the mechanisms of innovation for sustainability, the social process of production, diffusion, and utilization of various types of knowledge needs to be analyzed in detail. The cases of photovoltaics and water treatment technologies suggest that gaps and inconsistencies in the knowledge circulation system could pose serious challenges to the pursuit of sustainability innovation. The development of photovoltaics suggests a transition in the knowledge system in the evolution of the innovation process. Many R&D activities on photovoltaics in Japan have traditionally been conducted through research projects and consortia involving universities, private companies, and public research institutes, with financial support from the New Energy Development Organization. These extensive activities are considered to have made an important contribution to the steady and solid accumulation and sharing of technological knowledge. Recently, however, we have observed an explosion of investment in production facilities for photovoltaics by start-up companies mainly funded through financial markets by venture capital and private funds in the U.S., Europe, and China. That has had a significant impact on the price of photovoltaics and the extent of their diffusion, changing the nature of the innovation process. We could argue that this is a transition in the knowledge system from one based on R&D projects supported by the public sector for basic scientific knowledge to another based on investments in production facilities by private funds for societal diffusion. The pattern of innovation through university-industry collaboration, which functioned relatively well in Japan in the past as a way of creating scientific and technical knowledge, may not be working as well in utilizing financial knowledge. The importance of knowledge in promoting innovation for sustainability can also be seen in the case of membrane-based water treatment technologies. Relatively strong market positions have been maintained in membrane technologies by Japanese companies. They have not been tremendously successful in establishing a robust business model, however, since these companies are mainly producing components such as membranes and exporting them to other countries like China. Various types of knowledge are required for sustainable water management, including demand prediction, water treatment technologies, water management systems, infrastructure, and laws and regulations. The traditional innovation system based on close university-industry collaboration for basic technological development may not function effectively in introducing technologies in the context of different countries like China. European companies utilize various types of knowledge including technology, management, and operations as a package and are actively expanding in countries around the world. In Japan the water sector has been managed and operated for a long time by the private sector, which has thus accumulated a significant amount of knowledge and experience in the field. As privatization has been encouraged as a general trend in recent years, it is argued that this knowledge should also be effectively utilized for water management systems overseas through strategic collaboration between the public and private sectors.

011. Science Fiction and STS: Cultural Imagery of Future Technology, War, and City

9:00 to 10:30 am
13: 1312

In what ways can the study of science fiction contribute to debates on STS? The science fiction genre developed in the 20th century along with science and technology, and society. Science fiction sometimes critiques technological future, and sometimes supports it. It has depicted both utopia and dystopia. Though science fiction has always envisioned future technology, this session does not focus on a discussion of how imaginations in science fiction have come true, nor does it applaud the fabulousness of writer's foresight. Rather, it examines the richness and complexity of our view on science and technology. As Darko Suvin calls science fiction "cognitive estrangement," we are able to look on science fiction as a world where different types of imagination of the future, which could not be explained by science and technology alone, appear. The panel session brings together scholars studying fields include science studies, area studies, and media studies, and seeks rich and varied possibilities of science fiction. The papers focus on each aspect of science fiction and explore the diverse way of imagery of science and technology. It will examine the following themes: how weapons of the future are depicted in science fiction; how it is connected to the changing of science and technology, and society; how fictional imagination affects our daily life. The study of science fiction provides us with a thought-provoking perspective on related themes in STS, such as science communication, the popularization of science, and so on.

Participants:

The Images of the Future War and the Mobilisation for the Civil Air Defense in Germany (1919-1939). *Nobuhiro Yanagihara, University of Tokyo, JSPS*

The purpose of this paper is to explore the "science-fictional" imagination connected with "factual" activities of the civil air defense in inter-war era in Germany (1919-1939) and to analyze historically the "manipulated fear" of the imagined future war for mobilization of the civilians, and the "created security" through the civil air defense. First, I sketch out what imagination of the future the development of aircraft technology gave to people. The English and German science fiction represented two visions of the aerial bombing war in the fin de siècle. On the one hand,

the air technology created the peaceful and well-ordered world including the vision about uncivilized colonies controlled well by the airship with bombs. On the other hand, the terror and disorder dominated the world by the air raid. Furthermore, I show how the invention, the spread of aircrafts, and then the applying to the real war were changed after the Great War on the science fictions in Post-War Germany. Second, I analyze concretely the fictions of "areal-chemical war" against the civil people and the air defense activities social-historically in the Weimar era and the first half of NS-regime, for example, the civil air defense maneuvers for non-combatants (women, children and seniors) and reconstruction of the city for the air defense through the image of the air war. Analytically, I focus on the relationship between fictions and mobilization with terms of terror and security. This analysis on this paper will show the mobilized and realized imagination in the era of the total war.

Imagined Superweapons in Juza Unno's Science Fiction around WWII. *Maika Nakao, University of Tokyo*

Juza Unno, the popular fictionist during 1930s and 40s and one of the 'fathers' of Japanese science fiction, described several eccentric technological applications as well as various types of superweapons in his fictional novels (his fiction is called: science fantasy, military science fiction, and so on). He described weapons such as atomic weapons and death rays before their emergence. This paper explores the images or representations of superweapons in the Juza Unno's science fiction around WWII. Juza, as an ex-engineer, had an abundance of scientific knowledge and foresight. After the Sino-Japanese war broke out in July 1937, Juza emphasized the importance of scientific capability (Kagakuryoku) for Japanese national defense, and stated that the superweapon, as well as the country which creates it, will decide the war. Though he realized that Japanese science and technology was lagging behind the U.S. he did not or could not write the story of Japanese defeat. There arose the question of how he wrote of superweapons in his novels. In most of Juza's novels, superweapons were created by the enemy and sometimes their use would be foiled by a Japanese soldier through a suicide attack. The image of a suicide attack as a virtue preceded Kamikaze attacks, which began in the Battle of Leyte Gulf in October 1944. Thus the gap between ideal and reality was incorporated in Juza's fictional novels. The way of this fusion will be explored in this paper with broader perspective on war, censorship, and popular culture. Although the Japanese science fiction genre has generally been defined as being formulated after WWII, this paper tries to underscore Juza's novels as the roots of Japanese science fiction, a way of imagination on science and technology in modern Japan.

Always: San-chome no Yuhi and the Nostalgia toward the Image of Future City. *Takeshi Kadobayashi, Kansai University*

Always: San-chome no Yuhi (Always: Sunset on Third Street) is a Japanese film directed by Takashi Yamazaki that has won a commercial success in 2005. The story is set in a downtown Tokyo in 1958 and evokes nostalgia toward the post-war society of economic growth in which the future was always imagined as a better one. However, in this film that is full of nostalgic cityscapes, there appears one scene that depicts a future city imagined by a boy character. In order to understand this futuristic image in consistent with the nostalgia toward the past that dominates the whole mood of the film, this paper firstly examines the genealogy of the imagery of future city in Japanese popular culture (e.g. illustrated novel, manga, and animation) since WWII and how these images have evolved to be fitted in the diegesis of Always: San-chome no Yuhi. Secondly, this paper introduces the notion of the "nostalgia mode", one of the characterizations of postmodernism by literary critic Fredric Jameson, and situates this particular scene of the film within a broader context of the postmodern representations of future city. In doing so, this paper intends to sketch out another dimension of postmodernism and its peculiar sense of historicity in which the future intricately coincides with the past.

Imagining Enhanced Bodies: How Can Science Fiction Contribute to Ethics for the Governance of Emerging Technologies? *Ana Maria Delgado, University of Bergen*; *Kjetil Rommetveit, University of Bergen*

In this paper we explore whether and how science fiction can contribute to the production of alternative ethical frameworks for the governance of emerging technologies. Alternative frameworks are defined as deliberative, inclusive and socially robust. Taking the concept of 'socio-technical imaginary' as our point of departure, we explore how ethical concerns are framed in SciFi literature on body enhancement. We do so by using a double approach: through an extensive mapping exercise and by presenting an in-depth interpretation of the novel Neuromancer. We argue that the main relevance of SciFic for ethics resides in its capacity, in the here-and-now, for triggering ethical reflection, pointing to connections between the life- world of individuals and socio-technological developments as collectively shared. Ironically, this capacity is also its main weakness, as ethical questioning, concerns and issues in SciFi literature remain "undetermined" and "under-normative". When its limitations are considered, SciFic can be used as a deliberative tool within -still under-construction- ethics toolkits for the governance of emerging technologies.

Chair:

Maika Nakao, University of Tokyo

Discussant:

Takayuki Tatsumi, Keio University

012. Public Engagement and Cultural Contexts

9:00 to 10:30 am

13: 1321

Participants:

A Discussion on a Possible Way of Institutionalizing Participatory Technology Assessment in Japan. *Yukio Wakamatsu, College of Science & Engineering, Tokyo Denki University*

At the outset, the author of this paper has to specify that this paper lies between academic discussions and advocacy of participatory technology assessment(pTA). The first-ever Japanese Consensus Conference organized in 1998 using the theme of gene therapy, was reported and discussed in 1999 (Wakamatsu, Y.: A Citizens' Conference on Gene Therapy in Japan: A Feasibility Study of the Consensus Method in Japan, AI & Society(1999) 13:22-43). Since then, quite a few participatory TA events applying some pTA methods have been organized both as experimental and practical ones. The latter are, in some way or other, policy-related. In addition to these pTA practices, academic discussions and research projects on TA and pTA are not scarce. Academics and practitioners in this field, however, are not successful in raising and organizing political discussions in society, which are essential for institutionalizing pTA. In 1995, the present author discussed this situation in an international STS conference (Wakamatsu,Yukio:Toward Institutionalizing Participatory Technology Assessment in Japan (A paper presented at Technologies, Publics and Power, the Terrain of the 6th Framework in NZ and Beyond, 1-5 February 2004, Akaroa, New Zealand)). This paper first tries to shed light on this situation, arranging Japanese pTA events and related discussions on TA and pTA since the late 1990's chronologically. This arrangement will prepare a basis for placing these events and discussions in the tentative forum for institutionalizing TA and pTA in Japan. Using this chronological table of pTA-related events and issues in Japan, this paper proceed to discuss, first, the background and the reasons why a forum for discussing the institutionalization of pTA in Japan hasn't been formed, which must involve not only academics, practitioners but also politicians and the media, more in general, our society. Then, this paper goes on to discuss possible pTA forms in Japan, using experiences in the United States and some European countries

having pTA institutions, which show two types of institutions, one is parliamentary, and the other is independent from legal, administrative, and judicial powers. Finally, using the results of the above discussions, this paper suggests the third form of pTA institutions, in which TA and pTA would be conducted by the university sector and/or NPOs/NGOs under the auspices of government or parliamentary organizations. Thus, TA and pTA activities in this form would also be grounded in the "public sphere."

Community consultation: The paradox of public engagement. *Graham Lucas, University of Newcastle Australia*

Whether to satisfy some environmental or regulatory planning compliance, the rollout of most major infrastructure and engineering projects such as gas, water or electricity involves some form of consultation with members of the local community who are likely to be affected or perhaps benefited. There is a great deal of practitioner and agency literature that provides advice on methods and advantages of the community consultation process. The essence of community consultation is an engagement mechanism to gather public comment and opinion for consideration. Hence consultation is said to make people feel involved in the technical decision making process and lead to better engineering outcomes. However, there is also evidence to suggest that community consultation often becomes the engagement of an enemy as war erupts between expert project proponents and an emotion charged general public. The intended social inclusion becomes an adversarial engagement leading to community protest, anti-action and sometimes the mobilisation of extremist groups. Generally at this stage communities claim consultation is a farce and see their comments as being ignored and certain members of the public deliberately excluded. Whilst there are many social theories that can explain such responses, this paper presents ongoing doctoral research into community consultation using an Actor-Network Theory (ANT) approach to understanding the engagement paradox. It is argued that present approaches and models of community engagement are inherently adversarial since community consultation is generally commenced pre implementation and post engineering. Empirical examples from recent Australian electrical infrastructure projects will be discussed to argue the point. It is further argued that by adopting the alternative view point that ANT provides, there is scope for a new model of community engagement that embraces social inclusion pre-engineering. That is, ANT allows us to see how consultation might be used as an enrolment mechanism encouraging and promoting local politics during the earliest stages of engineering development. ANT also provides an alternative way of seeing local and global public engagement in terms of network scale. Both theoretical and empirically descriptive, this paper and the associated Doctoral research is relevant to the Sociology of Science and Technology since it focuses upon the very nexus where technology meets humankind. The aim is to improve the means and outcomes of public engagement and ultimately provide an understanding of how local and global socio-technical controversies might be better settled or averted. The paper will be of cross discipline interest particularly to those involved in social inclusion, community engagement, infrastructure development and engineering, town planning and environmental sciences.

French Protests over Nanotechnology: Public Engagement and Lessons Learned. *David M Berube, North Carolina State University*; *Christopher Cummings, North Carolina State University*

In an effort to outreach and engage the public in debates over applied nanotechnology, France instituted a series of public events. The first in Lyon was attended by experts as well as vociferous and disruptive protestors. The author, who is involved in a handful of federal grants to study public perceptions of nanoparticles using quantitative analyses of new data and has published significantly in the fields or argumentation and debate, follows the events and summarizes the project within an overall criticism of engagement models. This paper uses unpublished data to examine the possibilities that no engagement exercise can expect to avoid protest and outrage from citizen advocacy groups and non-government organizations. Rationales include: the technical nature of nanotechnology research and development, the opacity associated with its incorporation into consumer products, and so forth. The paper begins with a goal analysis of engagement involving nanotechnology. Next, this paper examines whether traditional engagement is appropriate for a representative sample audience (stereotypical public sphere). Indeed, this author suggests data justifies a tighter demographic focus examining individuals and groups more likely to participate in boycotts and protests might be more productive. Sacrificing some representativeness may produce more informed and pertinent debates over environmental health and safety, research and development, and marketing of products involving nanoparticles. This paper includes a study of the French engagement events and asks whether there are superior models for engagement that are more likely to result in productive dialogue. Efforts towards more organic engagement models as well as those involving social media will be examined. This includes an evaluation of the recent 2010 European Commission Services report on Understanding Public Debates on Nanotechnologies as well as a US White Paper on Engagement published through the National Nanotechnology Coordinating Office (authored by the presenter).

013. Session of Technology, Environment and Health Risk Governance I

9:00 to 10:30 am
13: 1322

At the end of the twentieth century, rapid development of society on a global scale caused vast changes and transformation. While industrialized society entered a new stage of evolution, globalization too brought with it a number of fresh challenges, on the one hand breakthroughs in newly emerging technologies, have brought with them global implications and developments. Yet no matter whether as a result of traditional technology or through the process of constructing new forms, globalization, with its rapid speed of development, has given rise to environmental pollution, transmittable diseases and food concerns, including global warming, disputes over CO2 or landfills, environmental hormones (persistent organic pollution, POPs) and HIV/AIDS.
A side effect of globalization, these newly emerging and closely observed interactions between technological, environmental and health risks which the aforementioned developments have given rise to, are fundamentally interdisciplinary in nature. Having been caused by both traditional and modern technology, they have overlapping and complicated environmental, technological, ethical, social risk perception and attributes of trust, as a result, this has already become an important governance issue and challenge for many countries around the world. It is in this context that this panel on 'Technology, Environment, Health and Risk Governance' implements this plan; hoping that by encouraging greater interaction and discussion, to get the ball rolling in terms of proposing related thesis, while experiencing a greater interflow of ideas and perspectives which will in turn deepen localized social risk governance research.

Participants:

Risk Perceptions of Lay People in Taiwan: A Comparison Between Nuclear Power Technologies and Genetic Technologies. *Deng Seng Chen, Graduate Institute of Sociology, Taiwan University*

There are two major research questions in this article. On the one hand, this study is going to describe risk perceptions frames of lay people in nuclear power technologies and genetic technologies and discuss their differences in these two technologies. Psychometric characteristics of risk perceptions are used to illustrate how lay people to develop their risk judgments (Brun, 1992; Slovic, 2000; Yen, 2007). Although the literature of psychometrics suggest that there is an universal psychological structure of lay people's risk perceptions, social actors might employ their everyday life knowledge to interpret the development of science and technologies depending on particular

social and cultural contexts. Therefore, the other cultural frame of risk perceptions is also employed to highlight the way in which social actors use everyday life knowledge to articulate their experiences with new but unfamiliar technologies (Parales-Quenza, 2004). On the other hand, it is interesting to investigate whether transfer of a risk perception frame from one technology to another technology occurs or not. Or, an individual tends to develop different risk perceptions regarding to different technologies. The research question about the transfer of risk perception frame could be answered by analyzing those who have favorite attitudes towards the two technologies have same risk judgments and risk perception structures. If they have different positions toward the both technologies, then it is necessary to study whether they use same elements to make their risk judgments.

Different ways of knowing pollution and risk. Coping with the effects of cadmium on soil, water and people through time. *Christelle Gramaglia, Research in sociology, UMR GEAU - Cemagref Montpellier*; *Ariane DEBOURDEAU, Centre de sociologie de l'innovation - Mines ParisTech*

Decazeville, Aveyron (France), is an old industrial basin where several metallurgic factories settled in the 19th century. Some are still operating, 47 years after the coal pits closed down. The small twin cities of Decazeville and Viviez have a rich social history related to the development of the mining industry. Yet very few accounts were written about the industrial nuisances in general and the deep transformation which affected consequently the surrounding landscape. Until recently, no record circulated about the impact of pollution on soil, water and especially on people. However, some aspects of it were well-known by geochemists and ecotoxicologists who have been studying its effects up to the estuary of the Gironde river, 400 km further, for many years. Great amounts of heavy metals, cadmium for instance, were discharged by one zinc factory and dispersed into the environment since the 19th century and are still trapped in the surroundings as well as in the sediments of the Riou-mort and Lot rivers. Even though industrial processes have improved greatly and industrial effluents are now controlled, the noxiousness of this old pollution remains and, depending on the variable conditions, can even see it toxicity increase. The paper we would like to present will address the different ways of knowing and living with pollution through time. We will discuss local knowledge about the most visible aspects of it. We will also describe how scientists produced data about it and are still trying to monitor it continuously since the 1990s. Cadmium, for instance, is very toxic. It accumulates and cannot be eliminated easily by living organisms. It affects vital and reproductive functions. Beside tests on plants and animals, an epidemiologic survey now reveals that some humans too were contaminated but very differently depending their sex or age. However, heterogeneous and sparse, the number of evidence makes it now possible to question the environmental past of the area and related remaining risks. How were industrial nuisances understood and addressed through time? What helped or impeded the process of making cadmium pollution visible and traceable? What does its inscription on the local agenda change to its study now? How do the specificities of cadmium dynamics challenge the management of risks associated with it? We will also refer to other existing case studies will be in order to compare and reflect on various strategies for managing pollution and maintaining life in highly contaminated places.

Cadmium, Rice and Women: Challenges of Women's Occupational and Environmental Epidemiological Studies in Asia. *Yi-Ping LIN, National Yang-Ming University, Institute of Science, Technology, and Society*

In this article, I analyzed epidemiological studies of occupational and environmental cadmium exposures to explore how sex and gender has been studied. I traced the first environmental cadmium pollution case of the Itai-Itai disease in Japan before World War II (WWII), and followed the three actors of cadmium, rice and women in modern society to argue that cadmium exposure might be a major women's health hazard in Asian countries. In 1987, cadmium and cadmium compounds were identified as the Group 1 carcinogens by the International Agency for Research on Cancer (IARC), because of their connection to lung and prostate cancer. Scientific evidence used to formulate regulations for cadmium was based on occupational epidemiological studies that tracked high-level exposures at work, and most of them were based on studies of male battery workers in the European countries. Cadmium has wide industrial applications after WWII, and many of these industrial products are manufactured in Southeast Asian factories by female workers. Further, cadmium is one of the most heavily accumulated toxins in both the environment and biological systems. The main route of environmental cadmium exposure for the general population is through the consumption of contaminated food. Although "cadmium rice" has been an important food safety issue in many Asian countries, studies of occupational and environmental cadmium exposure on Asian women's health are very limited. Previous studies have indicated that women, as compare to men, are more vulnerable to cadmium exposure because of their physiological differences (bone density, hormone, and calcium and iron deficiencies). Nevertheless, the changing gender roles in Asian industrialized countries might put women at high cadmium exposure at work. The study suggests further regulations of cadmium exposure, and more research on women's occupational and environmental health in Asia.

Chair:

Kuei Tien Chou, Graduate Institute of National Development, Taiwan University

Discussant:

Paul Jobin, CEFC Taipei office

014. Postphenomenological Research and STS I

9:00 to 10:30 am

13: 1331

Postphenomenology as a type of STS analysis has developed and been presented in 4/S sessions since 2007. We are here proposing a double panel with ten presenters plus a moderator discussant (Don Ihde) for the Tokyo 2010 meeting. Postphenomenology draws from phenomenology with respect to variational theory and the recognition of the importance of both first person and intersubjective descriptive analysis. But with a focus upon technological mediation, the more material transformations of human-technology-environment relations are emphasized. We propose to continue the presentation of "empirical turn" concrete studies in this style with this panel.

Participants:

Free will and neuroscience. *Junichi Murata, Philosophy, University of Tokyo*

Today there is a close relationship between science/technology and the lifeworld where we encounter new ethical problems. Brain death is a typical case. But various applied, bio and into ethics, according to Don Ihde, often fall into what he calls "ambulance corps" applications, those applied after the technology is in place, a hindsight view. He calls for a foresight view where philosopher/ethicians become involved in the development process. This calls for working with scientists/engineers with all the difficulties involved in learning each other's ideas and practices. I shall examine a possible role in neuroscience which involves consideration of capacities of mind, personhood and psychopathologies. Of special interest are experiments undertaken by Benjamin Libet which show that before someone recognizes a spontaneous behavior, definite brain activity has preceeded the experience which then seems to imply free will is illusory. By drawing upon phenomenological insights concerning free will I will show how Libet's results can be understood more postively. This will show ways in which phenomenology and neuroscience can cooperate to understand free will.

Two Dogmas of Phenomenology. *Soren Riis, Roskilde University*

Postphenomenology as shaped by Don Ihde diverges from two central aspects of classical phenomenology. Drawing from Husserl's work on intentionality, postphenomenology continues to stress the fundamental importance of how humans are embedded in the world. But whereas classical phenomenology was interested in the correlation of mental processes and objects, postphenomenology focuses upon the technical mediation between humans and their world. This results in discarding two classical dogmas of phenomenology, "reduction" and "essence." Instead, in a lifeworld of pervasive technologies, postphenomenology is interested in finding out how technologies mediae our experience in various ways rather than seeking one method which reveals single essences. This paper examines the contrasts in the two styles of phenomenology.

Smart Privacy Practices in different cultural contexts. *Mireille Hildebrandt, Associate Professor*

Smart technologies have far reaching privacy implications which require a rethinking of the meaning and value of privacy. If Japanese culture engages in different privacy practices than Western cultures, this will impact privacy implications. This is all the mor interesting because Japan seems to be far ahead with actually using smart application in everyday life. In my contrivution I hope to explore what Western legal philosophers could learn from the privacy practices that have evolved around smart technologies in the Japanese life-world.. I will take a postphenomenological perspective that entails a hermeneutic description of the affordances of these technologies.

Chair:

Don Ihde, Stony Brook University

Discussant:

Don Ihde, Stony Brook University

015. Aging and Regenerative Medicine

9:00 to 10:30 am

5: 511

Participants:

Configuring Readers: Science Communication in Regenerative Medicine. *Koichi Mikami, Oxford Institute for Science, Innovation and Society*

This paper investigates the roles of science communication in the field of regenerative medicine. In Japan, this field has become one of the most important areas of science since the invention of induced pluripotent stem cells (iPSCs). The technique of cell reprogramming to produce iPSCs was originally developed by Professor Yamanaka in 2006, and was successfully applied to human cells in 2007. The Japanese government has made a considerable amount of investment in this technique to maintain Japan's leading position in the international research community. To be accountable for such investment, the government published 'The Roadmap for iPSC Research', which not only explains the potential return on its investment but also demonstrates the expected progress in coming 10 years. There are also several books on regenerative medicine written by leading scientists in the field. These books target non-experts and explain the advance in the field without using scientific terminologies. These efforts of science communication seem to play important roles in this emerging field of research. These modes of science communication follow the deficit model, as scientists aim to inform, or educate, public about regenerative medicine. By explaining the complexity of the field, they wish to receive long-term support for their research activities. This kind of appeal is believed to be crucial in this field because regenerative medicine is unlikely to benefit society for, at least, another 5 to 10 years. Apart from this intended aim, the literature in Science and Technology Studies suggests that there are other roles that such communication may play. For example, the idea of 'configuring users' indicates that the readers of these books may be trained to appreciate particular values of the technology in the same way as their authors do. Similarly, the notion of 'boundary work' suggests that these books may draw the boundary between scientists as a writer and non-experts as a reader. Although these roles of science communication may be unintended, the ways in which such books are written are expected to reveal how society becomes structured around particular scientific knowledge. Based on discourse analysis of these books as well as several interviews with the authors, this paper aims to understand the significance of these books in the field of regenerative medicine.

Medicalisation of ageing: anti-ageing medicine and ageing well. A cultural comparison between Australia and Japan. *Maho Omori, Swinburne University of Technology (Melbourne, Australia)*

This is a working progress paper of my doctoral research focusing on biomedical technology and ageing. In particular, this research explores the reasons and meanings attached to the usage of anti-ageing medicines or supplements among older adults in Australia and Japan and cultural differences of what it means by ageing well behind its usage. In the time of rapid population ageing, biomedical technology in the form of anti-ageing medicines/supplements is a widely discussed and applied technological solution to combat ageing. Given the concept of medicalisation of ageing, ageing itself is seen as pathology and good health can be maintained or age-related disease can be prevented or halted through the usage of these medicines (e.g., Vincent 2007). Some research has found the growing popularity of anti-ageing medicines/supplements among older adults both in Australia and Japan (Cardona 2008; Brownie 2005; Ishihara et al. 2003). In the West, the strong emphasis of individualisation and consumerism may lead older adults to feel a great responsibility for their own health (e.g., Higgs et al. 2009). Cardona (2008) shows that some Australian older adults feel obligated to look after their own health by taking anti-ageing products in order to achieve ideal ageing. This reflects the Australian government policy that promotes successful ageing as keeping independence and autonomy through individual responsibilities (Palth 2009) and implies a bio-political, neo-liberal trend (Asquith 2009; Rose 2001). In this sense, natural ageing is no longer seen as an ideal. Rather, ageing process can be modified through technology as a way to meet social expectation (Turner 2007). In comparison, irrespective of the growing popularity of anti-ageing supplements in Japan, there is little qualitative research which explores in-depth about why Japanese older adults are willing to take those. I argue that it may not be appropriate to conclude that there is a similar impetus for use of these medicines/supplements in Australia and Japan since the concept of ageing is socially constructed and a social expectation (or even definition) of ageing well varies depending on cultures (e.g., Fox 2005). Contrary to the West, Japanese culture conceivably fosters more of a collective sense of responsibility for ageing (e.g., Traphagan 1999). Traphagan suggests that being responsible in later life for the Japanese elderly means carrying an active role in a reciprocal relationship. This suggests cultural differences in the perceptions of ageing well, which may result in different social circumstances that encourage an intake of anti-ageing medicines/supplements between Australia and Japan. To explore the aforementioned, this research will conduct qualitative research based on grounded theory: semi-structured face-to-face interviews both in Australia and Japan by the bilingual researcher (the author). It will involve older adults who are healthy and have been taking anti-ageing medicines or supplements with great awareness of their efficacy (i.e. assisting maintaining current good health to obtain ideal ageing). The research findings will contribute to the STS by evaluating the applicability of the western theories such as individualisation, consumerism, bio-politics among others to a non-western context, Japan.

Medicines, markets and consumers: The future of regenerative medicine as a 'lifestyle' choice. *Olivia Harvey, University of New South Wales*

Recent reports of regenerative medical therapies show that advances in the treatment of illness and injury utilising biological capacities of growth and renewal are moving apace. As particular

examples, descriptions of breast tissue augmentation and penis reconstruction give an inkling of what the future of regenerative medicine will be. While at the first experimental stages the focus is on the medical benefits for patients suffering from serious illness, I would argue that the imaginative potential of these new developments will shift consumption goals towards more cosmetic outcomes. Obviously such achievements in body modification will have significant benefits for patients with medical needs, but the real market growth for these technologies will most likely be for cosmetic purposes. I argue in this paper that the promise of regenerative medical therapies in a globalised market will mean that regenerative medicine will increasingly become a 'lifestyle' choice for the very wealthy. The concept of lifestyle enables us to project an image about how we would like our lives to be. The popularity of lifestyle shows on television and the proliferation of lifestyle magazines indicate that there is a burgeoning market for lifestyle consumption. Wealthy individuals in mainly Western countries are increasingly turning to these forms of entertainment as a way of meaning-making in everyday life. Reality TV lifestyle shows are the most popular form of this, showing consumers that they too could transform their bodies and selves through behaving in particular kinds of ways. Makeover shows like The Biggest Loser, Ten Years Younger, and What Not to Wear, promise perhaps the most radical interventions. Buying the right clothes, eating the right food and wearing the right make-up are sold to participants and viewers as the fast-track to a new you. I argue here that regenerative medicine, with its promise of using the in-built properties of biological function to restore or replace normal human functioning will ultimately come to be seen as an extension of this trend to remake ourselves in a more desirable fashion. There is a diverse body of social sciences literature in STS around biopolitics, bioeconomics and biosociality that indicates how global markets in new biomedicial developments have resulted in an increased role for consumers, and the opportunity for consumers to negotiate the services they require in a privatised, globalised marketplace that transcends national borders and the limitations of government healthcare systems. The promises of therapeutic treatment to fulfil the desires of consumers are now marketable commodities in these global markets. Global trade in organs, oocytes and reproductive services indicates that where the desire exists, market expansion will follow. This paper will use a textual analysis methodology to develop a critical analysis of the relationship between desire and consumption in the global market of regenerative medicine.

On the Relationship between Science Policies and Ambivalence in the Field of Regenerative Medicine. *Sosuke Iwae, Institute for Research in Humanities, Kyoto University*

The purpose of this research is to consider and reveal the following matters. What is the policy intention behind the extensive promotion of regenerative medical research in Japan? What is the nature of the public in public policies of regenerative medicine? What is the nature of ambivalence that is experienced by researchers in the field of regenerative medicine? In addition, how does this kind of ambivalence relate to the political and social background mentioned above? Many Japanese researchers in the regenerative medical field have already been engaged in heated international competition, and the government has increased public investments year by year. If gaining the upper hand in the competition is prioritized and a researcher is unnecessarily pressed to conduct clinical trials using stem cells, we might see cases like we have seen in past medication scandals. However, not much attention is paid to these kinds of problems. Instead, policy makers and scientific actors just emphasize the policy object "helping patients suffering from serious diseases" and getting a proper informed consent. Under such environment, I have seen some young Japanese researchers in the field of regenerative medicine developing a certain kind of ambivalence. They certainly understand that regenerative medicine is a successful way to treat patients with serious diseases, and that they should be developed more by the government. On the other hand, they have concerns about the future of their researches and the gap between scientific benefits and public benefits, because being experts of stem cells they also know that stem cells are still a "black box". I will mainly obtain data from policy paper materials. Firstly I will analyze the political context behind policies of regenerative medicine in Japan. Secondly, I will explore the nature of 'public' among public policies of regenerative medicine in Japan. Afterwards, I will collect and analyze the empirical data mainly obtained from interviews. In particular, I will analyze the discourse in interviews and group discussions with researchers about social and ethical aspects of regenerative medicine. Finally, I will investigate the association between political context and the ambivalence which researchers actually experience. "Good science is good ethics" is an old phrase but still has been practiced in the form of peer review system just for ensuring scientific rightness and validity. Social aspects of advanced medical science researches have been treated mainly by conducting outreach activities, symposia or public consultations. Although these measures are certainly important in order to construct good relationships with the public, many of them have been done in ritual and top-down manners based on the deficit-model. One of the reasons is that they only have had a few opportunities to be reflective about the connection and good relationship between science and society. Several examples of ambivalence among scientists show that they face certain kind of conflicts inside themselves, between perspectives as scientists and as citizens. Focusing on the ambivalence and creating opportunities for scientists to be reflective about their relationship with society could possibly encourage the scientific community to govern themselves properly.

Will everyone age similarly on earth? *Kayoko ISHII, Osaka University*

Will everyone age similarly on earth? Japanese researchers in field-medicine for community-based geriatric interventions pointed out that the English term 'disease' implies a concept of the causative agent or of the scientific mechanism of cause and effect. Concerning healthy status of the elderly, causes of their sufferings are often obscure and effects are complex, and diseases are not always completely curable. In social context, it is considered important to reduce subjectively perceived 'illness' and to ameliorate quality of life of the elderly and their care-givers as well. In recent years, multi dimensional approaches often include non-medical disciplines that focus psychological, cognitive, and social aspects of aged patients. It is also necessary to regard the patients as dwellers of communities and to overlook the ecological system including their cultural and familial backgrounds, histories and natural environments. Japan has the world's longest average life expectancy, and also the longest healthy life span (age when one can live independently and healthy). This may result from a mixture of different backgrounds. Besides common factors shared among industrialized countries, there may be regional factors such as: -traditional respects for senior members of family and society -virtue of working, being autonomous and contributing to the society even in the senescence -(at the same time) readiness to accept death as a right process of life: to refrain from struggling to postpone it -dietary traditions (humbleness in certain aspects) -possible genetic factors (such as Asian variations in mitochondrial DNA) -mild climate, and people's life-styles adapted to that These factors can influence medical practices, welfare and ethics of science and technology in Japan. Japan has another face. Providing supports for senior population and their caregivers has been one of main objectives of state-of-arts science and technology, notably robotics in recent decades. Communication and collaboration in research and development are extending world-wide. Possible applications of actual robots in general society, on the other hand, elicit arguments including question on the concept of 'humanness,' 'self-other relationships' and 'embodiment', etc. Considering wide and rapid propagation of information, technology, and people on the globe, it is crucial to develop social standards respecting universally acceptable common situations and region specific situations as well. The development of global and regional standards for application of

care-giver robots for the elderly would be one of good platforms. References [1] ISHII, K. Cognitive enhancement and longevity, Frontiers in Neuroscience, vol.3 (1), pp.114 (2009) [2] ISHII, K. Brain science lato sensu, Science & Technology Trends Quarterly Review, 29, pp.9-33 (2008) http://www.nistep.go.jp/achiev/ftx/eng/stfc/stt029e/qr29pdf/STTqr2901.pdf [3] ISHII, K. Cognitive robotics to understand human beings. Science & Technology Trends Quarterly Review, 20, pp.11-32 (2006) http://www.nistep.go.jp/achiev/ftx/eng/stfc/stt020e/qr20pdf/STTqr2001.pdf [4] The Japanese Cabinet Office. White Paper on the Aging Society: FY2007, (2008) [5] NISTEP. The 8th Science and Technology Foresight Survey, Study on Social and Economic Needs. NISTEP Report No. 94, 2005. [6] NISTEP. Support for People's Activities through Advances in Brain Science. In 'Social vision towards 2025 - Scenario Discussion Based on S&T Foresight -.' NISTEP Report No. 101, (2007)

016. Reflections of Traditional Japan on the Internet

9:00 to 10:30 am

5: 512

The Internet has been described as a communications and information provision tool that, in the hands of users, is a reflection of the culture in which it is used as well as an agent of impact on that culture. In this dual role, it serves as a reflection of the prevailing culture while also manifesting the values and beliefs within that culture. As an agent of impact in the hands of its users, traditional communications and information provision activities are enhanced and accelerated. In keeping with this year's STS theme of "STS in Global Contexts," our proposed panel is composed of the following four papers that take different perspectives in viewing the reflection and impact of the Internet on various facets of Japanese culture. In "Mobile Internet and Consumer Behavior in Japan," KAIGO Muneo focuses on mobile Internet access to customer review information and product price comparisons provided by various e-commerce websites and bulletin board services. Mobile Internet access to such information is continuing to bring changes to consumer behavior in Japan. The paper looks into the impact of such mobile Internet activity and the changes in values of Japanese consumers, commerce, and society over the past decade. In "Japanese Blogs, Robots in Seken as Japanese Life World," NAKADA Makoto looks at Japanese blogs and Japanese robots in seken, the traditional public space or 'life-world' wherein social activities are conducted and adjudicated. In this paper, he shows how Japanese traditional values (those with seken-related meanings and values) influence the narratives reflected on Japanese blogs and Japanese roboethics. In "How do They Define New Religion in Their Cultural Context? An Analysis of Japanese BBS Messages," TAMURA Takanori discusses new religious movements in Japan with specific references to how arguments surrounding and criticisms of such movements are intensified when transferred online. Using comparisons of differences between criticisms in the mass media and through "Ni-chan-neru" (a popular Japanese bulletin board service), he highlights how such discussions have defined the Soka Gakkai, as an example of a religious movement, in today's Japan. Finally, in "Modern Campaigning in a Traditional Context: Japanese Political Figures on the Internet," TKACH-KAWASAKI focuses on political party and candidate utilization of the Internet in election campaign periods. After a brief review of the 10-year history of online campaigning in Japan, the author uses case studies of political party and candidate websites from the 2009 general election campaign period to show how internet-based campaigning reflects traditional campaign practices in terms of the legal parameters of online campaigning as well as candidates' approaches to using the Internet. From these different perspectives, these four papers demonstrate our common theme of the Internet's impact on traditional values and cultures within Japanese society as well as its use as a new information and communications medium. We believe that when considered individually and collectively, these papers provide unique insights on the impact of technology on Japanese society, and also, the society's impact on the use of technology.

Participants:

Mobile Internet and Consumer Behavior in Japan. *Muneo Kaigo, University of Tsukuba*

In this paper, the author focuses on mobile Internet access to customer review information and product price comparisons provided by various e-commerce websites and bulletin board services. Mobile Internet access to such information is continuing to bring changes to consumer behavior in Japan. The paper looks into the impact of such mobile Internet activity and the changes in values of Japanese consumers, commerce, and society over the past decade.

Japanese Blogs, Robots in Seken as Japanese Life World. *Makoto Nakada, University of Tsukuba*

In this paper, the author looks at Japanese blogs and Japanese robots in seken, the traditional public space or 'life-world' wherein social activities are conducted and adjudicated. In this paper, he shows how Japanese traditional values (those with seken-related meanings and values) influence the narratives reflected on Japanese blogs and Japanese roboethics.

How do They Define New Religion in Their Cultural Context? An Analysis of Japanese BBS Messages. *Takanori Tamura, Seigakuin University*

In this paper, the author discusses new religious movements in Japan with specific references to how arguments surrounding and criticisms of such movements are intensified when transferred online. Using comparisons of differences between criticisms in the mass media and through "Ni-chan-neru" (a popular Japanese bulletin board service), he highlights how such discussions have defined the Soka Gakkai, as an example of a religious movement, in today's Japan.

Modern Campaigning in a Traditional Context: Japanese Political Figures on the Internet. *Leslie M. Tkach-Kawasaki, University of Tsukuba*

In this paper, the author focuses on political party and candidate utilization of the Internet in election campaign periods. After a brief review of the 10-year history of online campaigning in Japan, the author uses case studies of political party and candidate websites from the 2009 general election campaign period to show how internet-based campaigning reflects traditional campaign practices in terms of the legal parameters of online campaigning as well as candidates' approaches to using the Internet.

Chair:

Leslie M. Tkach-Kawasaki, University of Tsukuba

Discussant:

John Shultz, University of Osaka

017. Theorizing Nuclear in Asia: Nuclear "Renaissance" ? (I)

9:00 to 10:30 am

5: 513

THEORIZING NUCLEAR IN ASIA The dawn of the 21st century is marked by global energy crises threatening the stability of capitalist production around the globe. The rapid decline of fossil fuel supplies is one of the main factors, which is also accompanied by growing anxiety over climate change issues. Against the backdrop of both the fossil-fuel crisis and global environmental deterioration arises a renewed enthusiasm in nuclear energy that looms as an alternative to remedy the ensuing energy shortage. "Nuclear renaissance" has thus become a buzzword presented as a seemingly inevitable option for those nations seeking to secure their energy supply without harming the environment. Nuclear renaissance primarily refers to the claims that nuclear energy, thanks to techno-scientific advances in nuclear research, offers more benefits as compared to other energy regimes in terms of cost, safety, and production capacity. And perhaps no other place is currently celebrating the hype of a nuclear renaissance as much as Asia. With the rise of China and India, along with stable developments in East and Southeast Asia, Asia is among the most rapidly growing regions in the world in terms of demanding greater energy inputs. Nuclear power thus constitutes the primary source of energy that this region is seeking to exploit. This trend, however, comes with profound implications that shape the socio-political relations between and within countries in the region as the discourse of nuclear power is marked by both enthusiasm and controversy. Concentrating on how nuclear power has emerged and continues to emerge as a dominant techno-scientific regime in various parts of Asia, this panel proposal aims at critically examining the proliferation of nuclear power in East, South, and

Southeast Asia with special attention to four prominent actors that influence nuclear discourse, namely the state, the techno-scientific community, industry, and civil society. The panel is organized around two related themes, each of which will be conducted in separate sub-panels: (1) History and Epistemology, (2) the Image of the Atom, its Cultural History and Risk.

Participants:

RISK FROM BELOW: Nuclear Power and Popular Risk Assessment in Southeast Asia. *Sulfikar Amir, Nanyang Technological University (NTU)*

RISK FROM BELOW: NUCLEAR POWER AND POPULAR RISK ASSESSMENT IN SOUTHEAST ASIA Sulfikar Amir Nanyang Technological University, Singapore After being idle for a decade, nuclear power is increasingly gaining popularity among Southeast Asian states. The unprecedented rise of oil prices in international markets following the Iraq War, the global concern of climate change, and technological breakthroughs in the safety system of nuclear reactor design are among the crucial factors that render nuclear power a viable, strategic option for Southeast Asian countries to secure their energy supply. Most of these countries, including Indonesia, Thailand, Malaysia, the Philippines, and Vietnam have for some decades developed considerable capacity in nuclear research. But it is just recently that these countries are taking serious measures to materialize the production of nuclear power for energy generation. The growing desire for nuclear power in Southeast Asia has been accompanied by a variety of public responses in this region. These responses are by and large influenced by democratic developments in the respective countries. In Indonesia, for example, the state's plan to implement the nuclear energy program is being challenged by a strong anti-nuclear alliance constituted by various civil society groups demanding the current government to cut off the nuclear option from the national energy policy. Although lower in scale compared to its counterpart in Indonesia, Thailand's anti-nuclear movements are fervently showing their disapproval, pushing the government to rethink the nuclear policy. Focused upon the emergence of the nuclear regime in Southeast Asia, this study is intended to conduct a comparative observation of anti-nuclear politics in Indonesia and Thailand, two Southeast Asian nations with new democratic experiences. By comparing anti-nuclear politics in these new democracies, this study seeks to analyze similar and different structures of democratic institutions that shape how nuclear power is presented, perceived, and contested by citizen groups in both countries. The analytical concept used in this study revolves around the notion of popular risk assessment, a sort of people-based approach to assess risks of nuclear power. In this study, popular risk assessment is an alternative to the scientific approach of risk assessment. While the latter relies on technoscientific capital, the former is mostly drawn from social and cultural capital. To understand the process of popular risk assessment, this study delves into three issues: (1) structures of anti-nuclear networks; (2) dissemination of risk knowledge; and (3) production and mobilization of anti-nuclear discourses. In addition to developing a new concept that examines risk assessment, this study contributes to STS by providing a compelling case of the contestation between expert knowledge and popular knowledge in the Southeast Asian context.

Life Extension: Kori-1 and the Aging of South Korea's Nuclear Plants. *John Paul DiMoia, National University of Singapore*

John DiMoia Assistant Professor, Department of History & STS Research Cluster National University of Singapore In June 2006, the Kori-1 reactor, based in the SE corner of the Korean peninsula, was shut down for an evaluation period of eighteen months to determine whether it could function without risk of failure. Upon going critical in 1977, the reactor had been projected to be capable of an approximately thirty-year period of operation, after which it would be decommissioned. The request for a grant of "life extension"—declaring a nuclear facility safe for further operation beyond its projected specifications, following a period of inspection and rehabilitation—represents a critical issue not only in contemporary South Korea, but also in Taiwan and Japan, with the former undergoing a similar process with its first reactor. In the South Korean case, Kori-1 would ultimately receive an extension of 10 years, as announced in December 2007. As Cold War partners of the United States, these three countries were the recipients of substantial American aid through "Atoms for Peace," with South Korea and Taiwan also receiving considerable assistance through the University of Michigan's Phoenix Memorial Project. The legacy of a "built environment" in Park Chung Hee's South Korea, an infrastructure fueled in large part by nuclear energy after the 1973 oil shock raised concerns about the availability of imports (40% of the ROK's electrical power is now nuclear), remains a major environmental concern in the region. This is true not only as the ROK continues to construct new nuclear facilities—currently numbering twenty plants in use, with eight more under construction—but also as a number of its aging reactors reach the point of obsolescence.

Symbolism of Treatment and Fundamental Research: Medical Activities after the Lucky Dragon Incident. *Aya Homei, Manchester University*

Symbolism of Treatment and Fundamental Research: Medical activities after the Lucky Dragon incident Aya Homei, University of Manchester (aya.homei@manchester.ac.uk) In the presentation, I analyse activities and narratives of clinicians and biomedical researchers in Japan who were assigned to deal with the aftermath of the so-called Lucky Dragon incident (or bikini jiken in Japanese), in which the suffering of 23 Japanese fishermen, by the detonation of the first deliverable thermonuclear weapon codenamed Bravo at the US proving grounds on the Bikini Atoll in the Marshall Islands on 1 March 1954, was highlighted as a source of diplomatic contention between Japan and the US in the subsequent months. I focus on the symbolism of treatment that ascended in relation to the bilateral negotiations and that were exhibited in various interlinked sites such as medicine, officialdom, politics and news media, and examine how the rhetoric of treatment, which was also informed by the imagery prevalent in Japan of American doctors specialised in radiation injuries, shaped the ways in which Japanese biomedical researchers conducted and communicated their fundamental research on radiation sickness.

Chair:

Sulfikar Amir, Nanyang Technological University (NTU)

Discussant:

Itty Abraham, University of Texas at Austin

018. Impossible Engineering : Technology and Territoriality on the Canal du Midi

9:00 to 10:30 am

5: 514

Summary: Round Table bearing on Chandra Mukerji, Impossible Engineering: Technology and Territoriality on the Canal du Midi, Princeton (NJ), Princeton University Press, 2009. Participants: Sophie Houdart, CNRS, France (Discussant) sophie.houdart@mae.u-paris10.fr Karin Knorr Cetina, University of Chicago, USA (Discussant) knorr@uchicago.edu Chandra Mukerji, University of California San Diego, USA (Respondent) cmukerji@gmail.com Claude Rosental, CNRS, France (Chair) claude.rosental@ehess.fr Albena Yaneva, University of Manchester, United Kingdom (Discussant) Albena.Yaneva@manchester.ac.uk Rationale for the session and contribution to STS - see back cover of Chandra Mukerji's book: "Impossible Engineering is a masterful work. Mukerji gives us a convincing, original explanation of the baffling technological feat of the construction of the Canal du Midi. She elegantly combines science and technology studies, cultural history, cognitive science, and sociology to show us how cultural memory and collective intelligence contributed to marvels of engineering that no single group of experts could have accomplished. A must-read." Karin Knorr Cetina, University of Chicago. "Mukerji brings phenomenal scope and originality to the story of the Canal du Midi. Demonstrating how a material object can

be the result of collective social intelligence, she provides a model for how to write a new kind of history of science and technology. She brings together material and intellectual history and connects, in an exemplary way, the history of material objects to the development of new patterns of thought and social organization." Pamela H. Smith, Columbia University.

Chair:

Andrew Lakoff, UCSD

Discussants:

Albena Yaneva, University of Manchester, UK
Sophie Houdart, CNRS
Kyoko Sato, Harvard University

Presenting Author:

Chandra Mukerji, University of California, San Diego

019. Energy Politics and Cultural Context

9:00 to 10:30 am
5: 515

Participants:

Where is the power? An interdisciplinary dialogue between suppliers of technology, capital and policy for renewables. *Gard Hopsdal Hansen, Norwegian University of Science and Technology*

Climatologists say we have to; technologists say we can; and politicians say we will. Still, implementation of new renewable energy technologies progresses slowly. A shift to renewable energy, after a century and more fueled by hydrocarbons, involves a massive reconfiguration of the relationship between nature, science and economy - and consequently massive uncertainty regarding where, how and by who this path to the future is supposed to begin. Analyzing this reconfiguration is partly inspired by Latour's (2005) understanding of technological development as outcomes of the complex assembly of hybrid collectives from social and technical ingredients, with a particular focus on how the attribution of agency is distributed across human beings (see for instance MacKenzie, 2009). The paper looks into the dynamics between three groups of stakeholders in Norway: technologists, venture capitalists and politicians to analyze 1) how these groups evaluate their own and others' role with regard to commercializing new, renewable energy, 2) how these groups evaluate the technologies and frameworks, and 3) to learn how the respective actors assess investing time and money in a sector associated with technological uncertainty and socio-political complexity. A central aim is to identify communication gaps and strategies to overcome these. Better understanding of dynamics (and lack of dynamics) between important stakeholders may contribute to strengthen communication between suppliers of technology, capital and policy, and hence provide better terms for companies, safer financing and more adequate policy in the field of renewable energy and energy efficiency. The overarching theoretical framework is science and technology studies (STS) and economic sociology. These theoretical perspectives provide sound tools for analyzing actors and agency in a dynamic setting. Important supplementing literature includes theoretical work on (national) innovation systems, venture capital and technological development. The methodological approach consists of both quantitative survey based methods and qualitative interviews. The survey is directed to managers of all Norwegian venture capital companies, all members of the Parliament and all employees of some selected academic departments. To provide further understanding of the results, semi-structured interviews several members of each of three groups will be conducted. Latour, B. (2005). Reassembling the Social. An Introduction to Actor-Network-Theory. OUP. MacKenzie, D. (2009). Material Markets. How Economic Agents are Constructed. OUP

China's Controlled Nuclear Fusion Study in the Global Context. *ZHOU Cheng, Peking University*; *Xing Li, Center for Social Studies of Science, Peking University, Graduate School*

The science and technology engineering of controlled nuclear fusion reactor has been always concerned by contries in the world as it could be the hope to solve the energy problem of human, but the complexity of its engineering technical difficulties and other reasons led to its tardiness of development. ITER (International thermonuclear experimental reactor) is a major sized international joint research and development plan, the goal is to build ITER in order to prove the possibilities of nuclear fusion power generation in science and engineering ,at the same time it can accumulate empirical data. China started the study of controlled nuclear fusion since 1960s, but it had been in a backward level until 90's —the introduction and successful transformation of the experimental device of the former Soviet Union's T-7 superconducting Tokamak device .Since then China became a major force in the world's controlled nuclear fusion research. In 2006, China joined the ITER program formally, with the United States, Europe, Russia, Japan, India and South Korea sharing research tasks. But ITER is not always a plain sailing, however, aparticipator changed time after time ，the experimental reactor siting dispute and so on have kept the plan continuously delayed and changed . This paper reviews the the history of China's controlled nuclear fusion research at different times under the international background ,then summed up the successful experience of the past and try to explore the way forward in new environment. This paper has points below: 1)Controlled nuclear fusion research is unique: the peaceful use of nuclear fusion energy has hope of solving the world's energy crisis, so its research and development has not only scientific but also great social significance as a big science project.Cooperation is consensus;2)Now Controlled nuclear fusion research has made some progress ,but there is still widening gap between experiment and the real practical power generation. So huge capital investment is needed and great risks are unavoidable.Cooperation is full of difficulties;3)In the changing international context, China grasped the opportunity,did a decisive leap-forward development and made a successful example as pursuant and leap-forward development ;4)Many new problems have emerged,mainly in the situation when progress has been made continuously, dispute of interest became white-hot. China face to ITER in a responsible way: never give up the ; a reasonable fight for interests; extensive and adequate international assistance and cooperation. The contribution to the document of STS includes: Explores the new features of scientific and technological development in international and big science context. We face to a complicated situation: big science and technology project in social needs often have much to do with international participation and interfere.

E(missions) to and from Africa: How Radiation became safer in Ghana (1960-2010). *Abena Dove Osseo-Asare, Univ. of CA, Berkeley*

This paper compares the history of radiation protection services in Ghana with recent activities there. It argues that French nuclear tests in the Algerian Desert led to the establishment of radioisotope monitoring at regional hospitals and ports in Ghana. The paper focuses on circulation of radioactive particles (emissions) and visiting delegations of nuclear scientists to Ghana from Europe and Asia (missions). It uses archival documents alongside oral history interviews and participant-observation of Ghanaian physicists at conferences, ports, and in laboratories. Combining historical and contemporary analysis, the paper makes preliminary assessments of ongoing research by the author. It borrows from strategies of both historians and sociologists that have sought to understand for instance, "nuclearity" in Africa uranium mining (Hecht 2002), nuclear proliferation in South Asia (Abraham 1998), and geographies of nuclear security (ex. Gusterson 2004, Masco 2006, Petryna 2002). The paper contributes to the STS literature in that it shows for the first time how a Sub-Saharan African country leveraged concerns about the global spread of nuclear armaments to develop the radiation service program housed at the Ghana Atomic Energy Commission (GAEC). -- Historical. On February 13, 1960, France tested an atomic bomb in the Sahara Desert, becoming the fourth nation with nuclear capability. In Ghana, the proximity of the tests prompted national conversations about the dangers of

radioactivity. Ghanaian scientists were concerned that nuclear fallout might affect the northern reaches of the country, but were also interested in how the proximity of the test provided them with unprecedented experimental data. They took trips to measure radioactivity in the arid towns of Bolgatanga and Navrongo, interviewed townspeople, and wrote reports on the extent of possible damage. -- Contemporary. After the French bomb tests in the Sahara, the Ghanaian Ministry for Defense, Academy of Arts and Sciences, and other government organizations pushed to have the country join the International Atomic Energy Agency (IAEA) by 1960. Initially, Ghana joined the IAEA for assistance in monitoring radiation for medical research. However, scientists expected that participation in IAEA missions, alongside signing nuclear test ban treaties, would lead to provision of a nuclear reactor. (In fact, a reactor was not made available to Ghana until 1994 when China provided the GHARR-1, a small research reactor with 10 years worth of fuel.) As a dividend of membership in the IAEA, Ghanaian researchers have benefited from training programs, funding, and collaboration over the years. The IAEA continues to be a welcome guest in Ghana. During a recent mission, a Greek woman working for the IAEA, dressed in a spotless white suit with creative, bulky jewelry, led workshops for x-ray technologists. These health professionals were happy to have her in their midst and applauded her knowledgeable responses to their many questions. To map geographies of safety, the paper combines reports of such IAEA missions to monitor Ghana's nuclear and x-ray equipment with participant-observation of GAEC radiation protection specialists on their rounds to ports and hospitals.

Case report：Years of experience of Suzu, the former front in the war over Japanese nuclear politics. *shin yamaaki, none (freelance writer)*

In 1975, members of the Suzu Municipal Assembly in Ishikawa Prefecture, Japan, officially endorsed construction of a nuclear plant and the following year, the Kansai, Chubu and Hokuriku electric power companies announced a joint proposal for the plant site. Yet there was opposition to the plan among local residents, and with local politics tied to construction interests, many other factors came into play as political parties made the power plant a focus of their election campaigns. By the late 1980s, the community was divided and opponents were holding protests nearly every month. The controversy rumbled on, as land squabbles and more politicking further slowed the project, which finally turned out to be "frozen" by the electric power companies in 2003. What happened at this small rural city during the years was the power of money politics and the conflicts that destroyed close relationships in the community and even within families. This paper describes what the local residents experienced as well as the grassroots movements in Suzu City based upon participant observation and interviews from 1992 through 2006 so as to highlight the marginal area of a nationwide and worldwide hierarchy, while focusing on women in particular as women are treated as the others by men in a patriarchy society. In other words, by doing so, this paper aims at indicating multilayered domination relationships: men-nature, men-women and central-marginal; which as I observed had been (or still is) maximized at women who faced and survived difficulties in family matters even during the 29 years of conflict in Suzu where families were forced to take sides and land and other disputes put much stress on them. This paper would make a steady contribution to STS by adding a case report covering relatively long term from 1992 through 2006 on grassroots movement in a Japanese rural area, at which modern technology facilities tend to locate; yet the today's complicated and super-sized technology may require nearby ordinary non-experts citizens to assess it through interactions (i.e., conflicts and/or negotiations) as it is beyond the assessment capability of an expert(s) despite its much impact on their, and or course our, daily lives.

China's civil nuclear power: from government to governance. *Xiang Fang, University of Edinburgh*

In this paper I intend to unfold some sensitive topics that have not yet been discussed concerning China's civil nuclear power, including its technological situation, its policy decision-making since the 1960s, its industry governance, and (perhaps the most sensitive topic) its nuclear waste disposal. The process of China's civil nuclear power development shows the transformation of the industry from a military, top-down planning system to a civil and preliminary market oriented system. This transformation trend offers more space for public engagements and bottom-up politics. Even with this alteration, however, the industry still keeps its strong 'Chinese style' development model. China's civil nuclear power governance model is decided by the country's political system and by development requirements of the industry. The governance model is transforming alongside the development of the industry. From the 1980s, there are several rounds of institutional transformation occurring both inside and outside the government. China learns from western models of nuclear industry through the process of technology import. There are also some institutions which have been built up for connecting with international nuclear governance. China's nuclear industry is transforming from military to civil usage, from government agency and ministry management to corporation management. However, the development of the nuclear industry is not trying to copy the style of the western countries in the same way that China used to mimic the Russia style. Rather it is developing towards a localized governing style with the influence of western advance technology and management experience. This paper contains four main parts. The first is a brief introduction to the whereabouts of operating nuclear power reactors and nuclear power stations; it is also an introduction to the general condition of the country's energy supply - and to the economic and technological conditions of the civil nuclear power industry. This section gives reader a general understanding of the civil nuclear industry of China. The second part is about the process of policy-making for the country's first big commercial nuclear power station - Daya-Bay - at the national level. In this part, I discuss key policy-maker considerations regarding nuclear power in a specific historical period. In the third part, I discuss the governance of civil nuclear power in China at three levels: government and institutions; nuclear companies; and the public. From these three levels of information, readers will have some basic understanding of nuclear power governance in China. The final part considers the most sensitive topic of all: nuclear power waste disposal. In this part I introduce some of the preliminary discussions (concerning location, technology, and the economic conditions of waste disposal) taking place among Chinese scientists and experts.

020. Transformation of STS in Neoliberal States 1

9:00 to 10:30 am

5: 521

Neoliberal reforms have changed how science and technology as well as society works. In this period, many critical studies of the negative consequences of neoliberalism, such as the globalization of poverty and the inattention to social rights and social fairness, have been undertaken in the historical and social science fields. However, STS has generally not addressed the problem of neoliberalism with respect to science and technology. Rather, some currents in the STS field may even be viewed as supportive of the transformations. This session therefore aims to take an historical and critical look at how science and technology have changed under the neoliberal reforms, how science and technology policy have accordingly changed, and how STS has changed the direction of science and technology criticism according to these changes. Furthermore, the session will explore the direction of social criticism and science and technology criticism that points to how society or science and technology works according to a standard different from the one presumed in neoliberal thought. Social criticism and science and technology criticism -- that is, STS based on the ideas of social rights and social fairness that the neoliberal thought and policy fails to address -- will be pursued anew.

Participants:

Neoliberal Bias of Science & Technology Communication: Not only Japanese case. *Hidetoshi KIHARA, Kokushikan*

University, Tokyo

In the early 2000's a research movement called SHAKAI GIJUTU ('social technology' in English) emerged, and the topic of 'science communication' subsequently captured the interest of Japan's STS community. After 2005, some universities made also college courses designed to educate communicators and interpreters for science and technology, focusing on the communication specialist. This talk will examine from the above standpoint the relations between the full-scale neoliberal reform in Japan that started in the mid 1990's and the development of 'science communication' that coincided with neoliberal reforms. The theory and practice of 'science communication' have focused on 'interactive communication' (the contextual model) as an ideal situation for over ten years. However, the understanding of communication and also power are narrow and could be amplified in two ways. First, rather than understand communication and power as relations between actors, the focus could shift to 'institutions', the arena where inter-actor communication is made and inter-actor power is exercised. If science communication aims at the public interest, it should be made in the course of changing how broad power and also broad inter-actor communication work, that is, changing or criticizing the shape of 'institutions' as media for communication and power. Second, in most cases, the shape of 'institutions' that 'science communication' has pursued, i.e. 'interactive communication' and 'interactive power relation', overlaps with the ideology and the social system that the neoliberal social reform has pursued. The neoliberal reform accompanied by the complementary New Civil Society requires 'interactive communication' and 'interactive power relation' as the ideological institution and the social institution to make commercialization and public-private partnerships work well. Therefore, even if the pursuit of interactive communication looks like the deepening of democracy, the true picture is the market-oriented change of democracy, and consequently it would not realize the public interest achieved by political community. Science communication should be extended into the shape of power and communication that is able to realize the public interest of social rights and social fairness that the neoliberal thought and policy fail in.

Making Clean Energy Clusters in Economic Theory and Practice: Assessing the Limits of the Neoliberalism Argument. *David John Hess, Rensselaer Polytechnic Institute*

Neoliberalism is understood here as a political ideology that, in contrast with social liberalism, favors market-oriented solutions to economic problems rather than state-oriented solutions. Neoliberal ideology does not necessary imply the withdrawal of states from markets; rather, the state may be used to create new markets and to protect markets from their own dynamics of implosion. Neoliberal ideology can be expressed and modified in various social fields, such as government policy, corporate and civil society strategy, and scientific research. I begin by following a transition in the field of regional development economics from an approach that was based on a core industrial base, usually one or more large manufacturers with a supply chain, to an approach based more on interactions among elements of a cluster or agglomeration. I then explore how the transition in two fields (economic development thought and policy) is homologous with differences between social liberalism and neoliberalism as broad ideologies. With this background in place, I explore the empirical case of clean-industry development at the state- and local-government levels in the United States. I review evidence in support of the argument that the policies are closely aligned with neoliberal ideology, via their explicit referencing of cluster-oriented development and the favoring of market-oriented policies such as solar credits and regional carbon credits. However, I also provide evidence for countercurrents that are far from consistent with neoliberal ideology. Building on my recent argument in Antipode, I suggest that rather than conceptualizing neoliberalism as an historical shift in which one ideology becomes hegemonic across diverse social fields (including a social scientific field such as economics), one might instead think of the fields as having undergone diversification in which agonistic positions (neoliberal, social liberal, and other) are continually at play, both in oppositional and recombinant forms.

021. Climate Change and Science Communication

9:00 to 10:30 am

5: 522

Participants:

The place of movies on the formation of the publics and media opinions about climate change. *Inês Crespo, European Commission - Joint Research Centre*; *Ângela Guimarães Pereira, European Commission - Joint Research Centre*

This paper is a contribution to explore alternative tools for science communication, in particular for controversial issues such as climate change, where high stakes, diverse values and politics intertwine with the science produced and communicated to the publics. The perceptions generated and appropriation of the issue by the publics becomes strongly dependent on the content and format of the communication. Given that movies reach millions of people, we find important to explore the opinion formed through these types of mass media entertainment. In this paper we hypothesise that the media coverage for climate change movies reflects the public opinion about this issue and simultaneously it influences those publics. The opinion about climate change is therefore co-produced by the movies' publics and the media. In order to test our hypothesis we perform a media analysis of the online articles of the Portuguese press about the movie An Inconvenient Truth (Al Gore, 2006), which was defined by the authors as a documentary with scientific evidence for the anthropogenic climate change although it includes episodes from Al Gore's personal life. The media analysis focus on 2006 - the year of the movie's release - and 2007 - the year Al Gore visited Portugal to present his slide show about climate change, the year he received the Nobel Peace Prize together with the IPCC, and won the Oscar for Best Documentary Feature. We also analyse news and relevant literature regarding the Portuguese publics' opinions for the same period, and the presence of the climate change issue in the Portuguese political agendas, media, campaigns, and social and political events. The results suggest homogeneity of the media discourses. The news articles not only comment the movie but actually use it movie to criticise the USA position regarding the Kyoto protocol, to appeal citizens and politicians to action, to emphasize the scientific consensus on this issue, to address the political position of Portugal regarding climate change or the consequences it has or will have on the country. These findings will be illustrated by a selection of examples of the analysed news, and the differences and similarities between the messages presented in the media and the ones from the movie will be evaluated. To conclude, we will reflect on the imaginaries movies like An Inconvenient Truth create and on the place they have in the formation of opinion about climate change.

Can they be ignored? Publics formation through Climate Change movies. *Inês Crespo, European Commission - Joint Research Centre*; *Ângela Guimarães Pereira, European Commission - Joint Research Centre*

This paper is a contribution to explore alternative tools for science communication, in particular for controversial issues such as climate change, where high stakes, diverse values and politics intertwine with the science produced and communicated to the publics. The perceptions generated and appropriation of the issue by the publics becomes strongly dependent on the content and format of the communication. Given that movies reach millions of people, we find important to explore what publics become formed through these types of mass media entertainment. We explore climate change movies from different genres. We focus on the following ones: An Inconvenient Truth (Al Gore, 2006) which was defined by the authors as a documentary with scientific evidence for the anthropogenic climate change although it includes stories from Al Gore's personal life; Home

(Yann Arthus-Bertrand, 2009) a photographic documentary composed of aerial pictures of several places on Earth showing the over-occupation and exploration of resources; and on the science fiction movie The Day After Tomorrow (Roland Emmerich, 2004) that includes a warning for climate change. These movies not only belong to different genres but also have different approaches to present the climate change consequences. We evaluate the message they contain, and the image codes they have used; specifically regarding the climate change consequences we explore the different approaches used such as future predictions or present and past reflections, and the plausibility of the scenarios exposed. As method we perform a news analysis for the years of these movies releases of online newspapers from Portugal- the project case study- France- an European country where climate change movies with a broad reach have been produced in 2009- and UK- that has been presenting the climate change problem with impartiality. The content analysis of the media coverage of these movies helped us to unveil different channels through which these movies were distributed and presented to the publics as well as to explore the perceptions evoked by each genre and message presented. Furthermore, we review the filmmaking processes and their distribution. From the results of this first phase of our analysis emerge that these movies were actually used to introduce debate within the political, public and scientific spheres, efforts being made by some governments of their wide distribution, including events with free movie screenings. So, the function of these movies was well beyond entertainment. We have looked at online press articles, finding differences on how the message was presented in the news with regards to how the movies present climate change and how dependent that was on the movie genre. These facts lead us to reflect on the role climate change movies have as an information and awareness raising tool that cannot be dismissed as it seems to influence perceptions and appropriation of the issue by the publics. The fact that the scientific and political spheres use these movies to debate climate change, together with the producers' efforts to widely distribute them, makes movies a potential powerful tool to influence publics' attitudes towards climate change.

In the Name of Climate Science - Towards an understanding of the discourse surrounding Climategate. *Weiye Loh, National University of Singapore*

What is happening to our environment? What is becoming of our planet Earth? Why are there changes in the climate? What can or should I do or not do about it? All these questions and many more are what many concerned individuals are asking since the discovery of global warming. Untrained in the area of climate science, we turn to the climate scientists and the scientific community in general in search of the answers. We place our faith in science; we are told to do so. This, we oblige, despite it being an irony given sciences' championing of rational inquiry and skepticism. With the recent coming to light of the Climatic Research Unit (CRU) hacking incident however, our faith in science may have been shattered by the dissemination of documents pertaining to climate change research. The controversy prompted a slew of analyses, particularly of the leaked e-mail content (see Costella; Berg and Davidson), and calls to review the data supporting anthropogenic climate change. What exactly is happening to our environment? What can or should I really do or not do about it? And how do the social, cultural, economic and political structures (inter)act to (re)produce the hegemonic knowledge concerning the climate? In order to answer the afore-mentioned questions and hence achieve a more equitable under(standing) with the climate scientists, this paper proposes to analyze the discourse surrounding the climate science debate using the Climategate incident as the contextual ground for inquiry by analyzing the media (re)presentation of the incident and its analyses from various sources. Drawing references from the likes of John Dewey, Charles Sanders Peirce, William James, and Bruno Latour, et cetera, I claim that religious rhetoric has seeped into climate science debate and climate activism, and that climate data vis-à-vis transcendental truth has attained such elevated status that promotes the overlook of their contested states and advertises their trade. As a note on the side, it is my hope that readers will come to understand the fact that I want to explicitly declare my commitment to climate science and climate activism, implies that my critiques of them are by no means attempts to wipe out or completely oppose such endeavors. Indeed, it is through such critical inquiries that I seek to identify the problematics of scientific debates, and hence advance our scientific knowledge.

022. Time and the Biological (1)

9:00 to 10:30 am

5: 523

Scientific knowledge production brings the future into the present in which scientists imagine certain kinds of futures, ask questions framed by these vision, and craft knowledge and devices to get closer to these futures. Bringing together research from anthropology, sociology, feminist studies, science studies, and environmental studies, this panel discusses how differential conceptions of time, futures, and pasts manifest in different scientific imaginaries, research practices, and ways of knowing. In particular, we are interested in the configurations and articulations of different temporalities in projects related to "life" at various scales from the cellular to the global. Looking at various sites of biological knowledge production and focusing on material and semiotic practices, this panel explores how time is differently conceived, articulated, and acted upon. Further, we discuss the ways different biological entities and knowledges of "life" are emergent in the efforts to intervene in future problems with the technological arrangement of life. The papers also highlight that these interventions and ways of knowing are embedded in specific economic, political and ethical assemblages that help us understand the present state of things that articulate biology and politics in different ways. The papers in this panel explore divergent sites of scientific knowledge production ranging from the research concerned with agriculture to human health and mortality to environmental issues. The projects in which the presenters are interested include cloning endangered animals, banking crop seeds, genetically-modifying crops, producing meat in vitro, making stem cells, cryo-preserving bodies, "trading" in ecological life, researching "harmful" algal, and crafting tools to study cells. Attending to the practices dealing with different biological entities with divergent objectives, the papers show specific ways of imagining life, conceiving the biological, and doing biology. While all the studies are illuminating specificities of different cases, we aim to understand how the commonsensical notion of linear, homogenous time (of "the modern human") is complicated both with narratives of futures (as crisis, extinction, abundance, and immortality) and with the materiality of biologicals. Challenging a naturalized understanding of time, this panel shows various notions of time that scientists are working with, for instance, time of different entities and their milieus in processes, evolutionary time, and time that is mattered by projection. Weaving these studies together and putting them in dialogue, we can learn from conceptions of time in relation to the biologicals to explore the complex articulations of life and political economy, and open up new ethical, political, and economic questions. Thinking through different temporalities of the biological, this panel questions anthropocentrism and natural capitalism. In so doing we propose to rethink the relation between humans, nonhuman biological entities, and the milieu they co-inhabit. By centering temporalities in our discussion, it will be possible to see how imaginations of future shape our present ways of living, and ask how we would imagine different kinds of futures.

Participants:

Evolutionary Yarns in Seahorse Valley: Feminine Craft, Mathematical Figuring, Fabricated Biologies. *Sophia Roosth, MIT*

The Hyperbolic Crochet Coral Reef is a distributed venture of thousands of women who are cooperatively fabricating a series of yarn and plastic coral reefs in order to draw attention to the menace climate change poses to the Great Barrier and other reefs. The project first took shape when Margaret Wertheim, a science writer, discerned that mathematical models crocheted by geometer Daina Taimina evoked the morphologies of the organisms of the Great Barrier Reef (because hyperbolic geometry is characterized by an excess of surface area, it affords filter-feeding creatures a maximum surface area in minimal

volume). This paper is an ethnographic report on the Reef and those engaged in making it. In this paper I am interested in thinking through the Hyperbolic Crochet Coral Reef as a single instance of "fabricated biology," which I construe as being about hooking together knowing and making. For the makers of the Reef, fabrication is more than simply materializing metaphors or rearranging configurations of things; it is a mode of improvisational and exploratory, materially engaged craftwork, a constructive grappling with biological things apprehended via their manufacture. I think a new sort of engagement with biology may be in the making for Reef contributors, one that is about apprehending biological form not just materially, but processually. One consequence of such a process-oriented grasp of biology is that Reef contributors construe biology as itself a process (specifically, an evolutionary one) that, like crafting, tends to be changeable, error-prone, messy, and at risk. The Hyperbolic Crochet Coral Reef, I argue, is an artifact -- a culturally meaningful material thing -- that condenses current ways of thinking and enacting shared biologies and shared stakes in ecological health. Further, manufacturing such forms renders biology something whose evolutionary unfoldings are not only mimicked, but also analogically generated, through an ad hoc crafting of new crochet forms. The function I identify in hyperbolic crochet is not located in the crafted product, but rather in the crafted gesture, in the act of crocheting performed by Reef makers: it is the time-intensive physical labor put into crocheting and the improvisational experimental work of generating new forms that offers an embodied understanding of biological form and the temporality of evolution. The thousands of scientists, artists, and crafters who contribute to the Reef aim to inaugurate a new mode of figuring biology, one in which repetitive gestures recapitulate the protracted piecemeal depositions of polyps and crafty improvisations offer tangible ways of understanding morphogenesis.

Cryonics and the Temporalities of Reanimation. *Tiffany Romain, Stanford University*

Based on 18 months of ethnographic research, this paper explores cryonics, the freezing of bodies after death with the hope that someday—in the near or distant future—these bodies (or at least consciousnesses) will be revived and restored to health. It is an American practice that grounds itself in the language, logic, and procedures of science and biomedicine while also drawing heavily on science fiction imaginings and narratives of the future. Like many mainstream biomedical technologies and practices, cryonics offers to extend life and "buy time." Cryonics, however, offers the possibility of buying much more time—ultimately, immortality. Aware that there is only a very remote chance of cryonics working, cryonicists take part in cryonics based on a hope for and a faith in a future of technological and medical progress and the long-term stability of society. This paper investigates the complicated socio-temporal scales that are associated with cryonics, which require simultaneously existing in the present and in projections of the future. I draw on rich ethnographic examples of how cryonicists dually experience the present and future and reorient goals and aspirations when engaging with the possibility of future immortal life. For instance, many plan to attain multiple PhDs, travel the galaxy, or experience radical physical transformation in the far future. And, at the same time, these cryonicists contend with the present, mundane tasks of the everyday, often dominated by routine and work. Cryonicists, engage with the past less often, but when they do, it is largely used as a marker for progress. I argue that the practices of imagination and projection through which cryonicists experience and engage with the distant future are often embodied and have material consequences in the present.

"Since Evolution has Not Provided": C4 Rice and photosynthetic change. *Chris Kortright, University of California, Davis*

Based on 15 months of ethnographic fieldwork at the International Rice Research Institute in the Philippines, this paper focuses on a specific research project as it attempts to change the photosynthetic pathways of the rice plant—known as C4 Rice. This paper discusses the central role of evolutionary discourse in the construction of this rice project—evolution both as a discourse accounting for the past, and as a project making the future. Evolution is evoked as two kinds of change. The first notion of evolutionary change is through the tracing of the evolution of C3 to C4 plants and the environmental/climate changes during this evolutionary process. Researchers illustrate over 50 independent examples of plants evolving from C3 to C4 photosynthetic pathways. Secondly researchers explain their scientific intervention as evolution through this history of change. They project past plant evolution into the future as a "potential" for change. This "future vision" and evolutionary discourse frames the researchers; transgenic intervention as "assisted evolution." By projecting evolution into the future, these researchers are reframing conceptions of what "evolution" and "natural selection" can be. This paper explores how technological change in the biochemistry and anatomy of the rice plant is characterized as an alternate "evolutionary route;" these researchers say that nature could have happened differently, but for contingent reasons didn't, and therefore it is desirable to attempt another path scientifically, which will be equally "natural." C4 rice researchers have traced a common ancestor between rice and other C4 plants like maze and sorghum, that branched off as a result of a more efficient photosynthesis pathways. As a result, they argue, rice could have become a C4 plant (just as it might in the future because of the CO2 level due to climate change). Since C4 rice would be more efficient than the present varieties of rice and could have happened in "nature" but didn't, they argue they are "assisting the evolutionary process" through genetic engineering. As one researcher stated, "Since evolution has not provided a C4 rice, it is left to scientists to imitate nature using genetic engineering." Researchers argue that genetic engineering is another tool that can be used by plant breeders by utilizing the process of natural selection as a conceptual and methodological tool. Thus to increase production, better utilize water and nitrogen, and to best cope with climate change, they argue that their biological intervention is a "natural step." It is through these "future visions" of evolution that the C4 rice researchers' conceptual work reinserts humans back into nature through "assisted evolution." This argument thus moves beyond binary arguments regarding GM crops as either natural or scientific, and beyond traditional notions of breeding and evolution.

Archiving the Past or Banking the Future?: Seed banks and the conservation of global biodiversity. *Lyndal Halliday, University of Sydney*

Seed storage and botanical collecting have long been part of agricultural and scientific organisation. Most recently, two large-scale seed bank projects, the Doomsday Vault and the Millennium Seed Bank Project (MSBP), have taken the practice of seed banking and ex-situ conservation to new levels. Both banks are ambitious in their scope by promising a safe haven for global biodiversity in the face of the entangled crises in food production, continued genetic erosion and environmental destruction, and also offering themselves as part of the solution to biodiversity loss through the research and regenerative potentials within. However, seed banks are more than simply storehouses of physical seeds. Like any archive or collection of artifacts, they operate as sites of contestation and interpretation that demonstrate how the social and political contexts of collections and knowledge are as important as the actual content of the collections. Archive literature offers a rich lens through which to view the Doomsday Vault and the MSBP projects, specifically the interplays between the past, present and future that are embodied in the archive. For archive theorists, collections often represent an attempt to recreate or restore a nostalgic and sanitized past, while preserving and promising something for the future. Indeed, the promise of restoration, salvation, and new life is deeply embedded in the contemporary collection and application of biomaterials in large-scale seed

banking projects. Against the backdrop of global biotechnology, informational capitalism and widespread environmental concern, this paper considers the Doomsday Vault and Millennium Seed Bank to be botanic archives and reexamines the promissory role of ex situ conservation of biodiversity.

Chair:

Chris Kortright, University of California, Davis

023. Medicine and Gender in Global/Local Politics: Session (1) Controversy and the Biomedicalization of Women's Reproduction

9:00 to 10:30 am

5: 524

This panel aims to broadly explore and critically examine the medicalzation and biomedicalization of women's reproduction in the East Asian societies through four cases of controversy: hysterectomy in Taiwan, hormone replacement therapy in Taiwan, egg donation in Korea and multiple embryo implantation in Taiwan. The first paper "Hysterectomy in Three Keys: The 'Uterusless Village' as Rumor, Experience, and Knowledge in Taiwan, 1950s-2000s" claims to understand the practice of hysterectomy in Taiwan as a product of uneven distribution of medical resources to rural areas, a lack of surgical regulation, women's experiences with birth control and their body perceptions. The second paper "Local Embodiment as Risk Governance of Hormone Replacement Therapy in Taiwan" explores the contradictory ways of constructing local biologies by lay menopausal women and professionals in managing HRT risks. This paper argues that while clinical physicians make professional boundary to emphasize the objectivity of medical knowledge, the local embodiment of menopausal women becomes the disqualifier for the truth claiming of research results from other countries. The third paper "How Are Egg Donors Supported by Women after the Hwang Scandal" intends to reveal the voices and experiences of egg donors during the internationally known scientific controversy. The fourth paper "Framing Risk and Framing Motherhood: The Multiple Embryo Implantation Controversy in Taiwan" argues that medical professionals in Taiwan employ multiple resources of framing risk to sustain the efficacy of achieving pregnancy through multiple embryo implantation, select certain international standard during policy transfer, and thus transform little of their practice even facing international debates and local pressure for regulation. The paper also explores how the various of gender scripts are strategically used to justify the use of multiple embryo transplantation. The four papers analyze how the key actors -- medical profession, the state, the international medical community, the pharmaceutical companies, the civil society, and the women themselves - interact and negotiate with each other to control and transform women's reproductive bodies. Putting the four cases together, which covers different historical period, we can trace the trajectory of change in women's reproductive medical practices, and scrutinize the transformation of medicalization to biomedicalization in East Asian Contexts.

Participants:

Hysterectomy in Three Keys: The "Uterusless Village" as Rumor, Experience, and Knowledge in Taiwan, 1950s-2000s. *Hsiu-yun Wang, Graduate Institute of Gender Studies, Kaohsiung Medical University*

In the early 1990s, reports on "uterusless villages" (wu zigong cun) and "uterusless streets" (wu zigong jie) made sensational news in newspapers and popular magazines in Taiwan based on rumors that almost every woman in a certain village or on a certain street had undergone hysterectomy, rendering those places "uterusless." News reports accused certain Ob/Gyns of removing uteruses out of greed. When the Taiwan Association of Obstetrics and Gynecology refused to enter the National Health Insurance plan in 1995, these local and media-amplified rumors played a part in the negotiations between this association and the Bureau of National Health Insurance. Drawing on medical records (National Health Insurance databases), news reports, and interviews with women, midwives, and physicians, this paper examines the "uterusless village" at three levels: the rumors, women's experiences, and the medical practice of hysterectomy in rural areas in Taiwan over the last half century. The rumors seem to conceal more than they reveal. The circumstances under which women accepted the surgery were more complex than has generally been assumed. I argue that the practice of hysterectomy is a product of uneven distribution of medical resources to rural areas, a lack of surgical regulation, women's experiences with birth control and their body perceptions.

Local embodiment as risk governance of Hormone Replacement Therapy in Taiwan. *Zxyyann Jane Lu, National Yang-Ming University*

The medical circles have used Hormonal Replacement Therapy (HRT) on menopausal women for over 70 years, but the controversy remains. The findings reported by NIH in the US in July 2002, confirmed by the UK Million Women Study in 2003 as well as HABIT study in Scandinavia in 2003, indicated that using HRT may increase cardiovascular and cancer risks. This study explores the contradictory ways of constructing local biologies by lay menopausal women and professionals in managing HRT risks. Taiwanese menopausal women and physicians prescribing HRT were interviewed and texts including media and professional were analyzed. While the decreased use of HRT among Taiwanese menopausal women resulted from the NIH report had commented as irrational reaction by the Taiwanese Menopause Society, the individual modification of dose and duration has developed to negotiate risks based on women's body constitutes and genetic compositions. However, professional medical practice integrated the lay management revealed the false divide of lay and professional knowledge. While OB/Gyn physicians continue their challenges on the credibility of WHI results in order to maintain the authoritative position in HRT menopausal treatment. The local knowledge of race, such as body size, genetics and age of menopause and cultural practices such as diet have emphasized by Taiwanese clinical physicians in contrast to Euro-American female bodies and in turn resist the legitimacy of risk claims of US and European research. In conclusion, while clinical physicians make professional boundary to emphasize the objectivity of medical knowledge, the local embodiment of menopausal women becomes the disqualifier for the truth claiming of research results from other countries.

How are the egg donors supported by Women after the Hwang scandal. *HYUNSOO HONG, The Institute Medical Science, The University of Tokyo*

The egg donation for ES cell research was hotly discussed during the Hwang scandal. The Hwang scandal involves the fabricated statement of Dr. Hwang about the voluntary egg donation of all his eggs used in the research. Egg donor A had believed the statement and given her eggs voluntarily to the research but was traumatized when she found out that most eggs had been acquired on a purely commercial base. 35 groups of Korean Women and a committee for human rights in MINBYUN (Lawyers for a Democratic Society) gave a declaration on February 6th, 2006 that they will open "the egg donor victim center". They also announced that they would file a lawsuit against the Korean government on behalf of the egg donors experiencing negative effects from the hormonal drug and egg retrieval. The lawsuit sought compensation for damages resulting from the governmental support of the ES cell research. Many women's groups united to speak as one voice to support the egg donor victims after the Hwang scandal, as the declaration shows. The purpose of this study is to clarify the following questions: (1). What did the women insist on? What kind of support from the Korean society towards the egg donor victim did the women's groups demand? (2). How the women groups support helped the voluntary egg donor A to recover from the psychological and physical shock she has experienced after Hwang's scandal. What roles did the groups play in her recovery? I believe it is important to research the effect the Hwang scandal had on egg donor A and how she dealt with the situation during and after the scandal, since through analyzing the above issues, one can clarify the positive aspects of women's groups and the possible ways to support a victim of a social scandal.

Framing Risk and Framing Motherhood: The Multiple Embryo

Implantation Controversy in Taiwan. *Chia-Ling Wu, National Taiwan University*

Regulating the number of embryo transferred in IVF has become an important debate among the international world of reproductive medicine. While in the Nordic countries, one or two embryo transfers have been the norm since late 1990s, in Taiwan the average of embryo transferred is 4.07 and 66% of IVF cycles involve four or more embryos in 1998, ranked the highest globally, followed by the US and South Korea. This paper examines why Taiwan reaches such a controversial practice in IVF for the past 20 years. In the late 1980s, practitioners of IVF in Taiwan defined risk in terms of pregnancy rates and live birth rates, rather than health risk to mothers and fetus in the late 1980s and early 1990s. Although the international debates on regulating number of embryo transfers brought sporadic academic discussion since mid-1990s in Taiwan, Taiwanese practitioners tend to individualize IVF centers and customize users, disclaiming a universal practice and the need to limit the number. Women who suffer from having under-weight multipletes occasionally revealed complaints to the media. However, it is their stories published in the newsletter of Premature Baby Foundation that lay people's form of defining risk began to gain credibility, and hence started a debate outside the social world of reproductive medicine, augmenting discussion among patients groups, pediatricians, and ob-gyns. Nevertheless, using US guideline -- one of the most lenient one internationally - as a model example of scientific risk governance, Taiwanese Society for Reproductive Medicine lobbied for the five or less transfer policy in Human Reproduction Act in 2006, possibly the most permissive regulation in the world. Through this case study, I argue that medical professionals in Taiwan employ multiple resources of framing risk to sustain the efficacy of achieving pregnancy through multiple embryo implantation, select certain international standard during policy transfer, and thus transform little of their practice even facing international debates and local pressure for regulation. I also explore how the various of gender scripts are strategically used to justify the use of multiple embryo transplantation.

Chair:

Chia-Ling Wu, National Taiwan University

Discussant:

Miho Ogino, Doshisha University

024. The public understanding of climate change: media analysis in Japanese and United States contexts

9:00 to 10:30 am

5: 531

This panel focuses on the public understanding of climate change through media analysis. In the STS literature, few studies comprehensively examine media representations of climate change and their impact on public understanding and engagement, which is of central importance of the emerging 'cultural politics of climate change' (Boykoff et al. 2009). This panel is organized to fulfill such important but underconsidered interactions in the STS literature. To reflect upon the conference theme 'STS in Global Contexts,' the papers analyze media representation of climate change in the contexts of Japan and the United States which allows the panel for elaboration on comparing those contexts to get better understanding of the global context of climate change. The papers on the Japanese context range from quantitative and qualitative media analysis of how climate change is generally portrayed in major Japanese newspapers, to public opinion surveys on the impact of such media reporting, and to critical frame analysis of media representations of the Intergovernmental Panel on Climate Change (IPCC) in Japan, which could be regarded as a relatively comprehensive and systematic set of papers that can rarely be collected. The first paper examined the relative distribution of stories regarding climate change of from April 2006 to March 2008, and, in order to understand how Japan's mass-media reported climate change, a content analysis of newspaper articles was also conducted. The second paper on public opinion survey discussed about the mid-term target of Japanese government. The conclusion of this paper is: (1) despite the economic recession, people supported higher mid-term target; and (2) this seemed to be a response of mass media coverage of climate change issues including the discussion of the target. The third paper analyzes how the Intergovernmental Panel on Climate Change is portrayed in three major Japanese newspapers by employing framing analysis in a way that the results can be comparable cross-nationally, namely whether a 'balance as bias' (Boykoff & Boykoff 2004) and ideological difference (Carvalho 2007) in the reporting can be detected, and what the social implications are. The paper focusing on the United States context analyzes trends in coverage of climate change in traditional and new/social media, and explore contextual elements as well as journalistic pressures that contribute to how climate-related information becomes 'news'. Amidst these trends and conditioning factors, two related issues are further explored: (1) examinations of who are considered 'experts', authorized through media attention to speak on these issues; and (2) how these play out distinctly between traditional and new/social media sources. The discussion can be expected on detailed comparison between the contexts of Japanese and the United States in terms of media representations of climate change, especially those related to climate experts. The papers will be supplemented by a presentation reporting on a recent attempt to connect climate change researchers and journalists in Japan conducted in 2009 and 2010.

Participants:

Communicating Climate Change: A Content Analysis of Major Newspapers of Japan. *Yuki Sampei, National Institute for Environmental Studies*; *Midori Aoyagi-Usui, National Institute for Environmental Studies*

The public learns much about the science of climate change through the mass-media in developed country. Most of the Japanese general public get information about climate change issues from television and daily newspapers. It has been shown that public concern rises and falls with the volume of reporting in mass-media. Although the quantity of coverage is important, it is likely that the content of mass-media coverage also plays important role in shaping public concerns and understandings. To provide effective risk communication with the public, it is essential to understand the way in which the media select and transmit of climate change information. In this paper, we examined the relative distribution of stories regarding climate change of from April 2006 to March 2008. And, in order to understand how Japan's mass-media reported climate change and its impacts, we also conducted a content analysis of newspaper articles. Our quantitative review showed a rapid increasing of the total number of articles regarding climate change after January 2007. And, we found the differences of themes of newspaper coverage before and after January 2007. After January 2007, articles in which climate change reported as main topic were increased in international and domestic political fields. It was suggested that this quantitative and qualitative change of coverage played some role raising public awareness of climate change. In terms of climate change impacts, we found that less than 20% of articles reported about negative impacts of climate change. Some types of impacts, such as water resource, foods products or health, got less coverage than others. Moreover, journalists highlighted the present impact, and they hardly provided information about occurrence probability or range of expected impact. Furthermore, we also revealed that a few articles referred to the present needs to prevent and mitigate their future consequences. Few articles explained that implementation of some countermeasures might mitigate the future impacts. These findings suggest that newspaper coverage in Japan might provide the public with insufficient information to think about and make their decision for their future.

Public response for the Japanese mid-term greenhouse gas emission reduction target, and the effects of mass media coverage. *Midori Aoyagi-Usui, National Institute for Environmental Studies*

In this paper, we examined people's responses for the mid-term target of greenhouse gas emission reduction. The Japanese government announced 15% mid-term greenhouse gas emission reduction target against 2005 level by then Prime Minister Taro Aso in June 10, 2009. After this, the government has changed

and new Prime Minister Hatoyama announced 25% target against 1990 emission level in late September. Our monthly public opinion survey which we asked two questions of "the most important issue in the World" and "the most important issue in Japan" showed that when first mid-term target had been discussed during first six months of 2009, people's concern for the environment was relatively low, because unemployment rate was historically high in Japan, and people's concern for the Japanese economy and unemployment was highest among whole social issues. But another series of our public opinion surveys which focused on mid-term target conducted on April, June and July in 2009, following the governmental press releases about the target showed, despite the economically bad situation, Japanese public's high risk perception for climate change consequences. People supported "sufficient reduction target against climate change consequences", because "developed countries have a responsibility for historical greenhouse gas emission" and "developed countries/regions do not have enough money, enough human power for tackling this issue at this moment", but "countries who are achieving rapid economic growth should share the mid-term target with industrial countries." After the first target was announced, concern for the environmental issues was the highest priority for the first time in eleven months in June 2009, and again in September 2009. The mass media coverage of climate change issues including mid-term target was increased in this June and September. "Welcome" articles for higher target are often seen in newspaper articles and television news programs. This is clearly showed public concern are responded to mass media coverage both in newspapers and television news program about the climate change including mid-term target.

Framing analysis of Japanese major newspapers' reporting on the IPCC. *Shin'ichiro Asayama, Jiji Press; Atsushi Ishii, Center for Northeast Asian Studies, Tohoku University*

The Intergovernmental Panel on Climate Change (IPCC) went positively into the headlines of mass media when it received the Nobel Peace Prize in 2007. The IPCC has again been featured prominently in the news but this time negatively because of the outbreak of the 'climate gate' incident where the emails of the researchers at the Climate Research Unit of University of East Anglia, UK who were heavily involved in the IPCC were obtained through hacking the mail server and its disclosure spurred heated debate around the world whether those emails indicate misconduct of those climate scientists. In order to evaluate how this would affect public understanding of climate science, one has to examine how the IPCC and climate science had been reported in mass media before the incident as a starting point. Such examination has been accumulating mainly in western democracies but Asian countries including Japan and the developing world are left in a vacuum. This paper analyzes how the Intergovernmental Panel on Climate Change is portrayed in three major Japanese newspapers by employing framing analysis in a way that the results can be comparable cross-nationally, namely whether a 'balance as bias' (Boykoff & Boykoff 2004) and ideological difference (Carvalho 2007) in the reporting can be detected, and what the social implications are. The newspapers were selected as analytical units because they are Japanese peoples' major and trusted information sources constructing public understanding of science and technology issues. To conduct a systematic and comprehensive analysis for this purpose, we employed Pan and Kosicki's framing devices (Pan & Kosicki 1993) and applied them to articles which refer directly to "IPCC" during the period of 1988 to 2007 (a total of 1206 articles). From the results we found that the IPCC is portrayed as a "value-free," "apolitical," and "rational" scientific assessment body which alarms society with its predictions of disastrous climate change impacts. We also found that all three major Japanese newspapers portray the IPCC almost identically. The social implications of this IPCC portrayal to Japanese society are: 1. Considering Japan's current level of greenhouse gas emissions and the status of proposed climate policy implementation, the portrayal of the IPCC as described above may not have been a factor influencing Japanese climate policies; 2. This IPCC portrayal may prevent rich understanding of IPCC's climate science in Japanese society because it emphasizes only scientific aspects and totally ignores the ethical and political aspects of the IPCC and its reports. As for the cross-national comparative analysis, we made it clear that no 'balance as bias' nor ideological difference could be detected in the reporting of the IPCC by the Japanese newspapers and argue that this could be explained by the journalists' norm of "strict division between fact and opinion" and almost exclusive reliance on bureaucrats as information sources.

Who speaks for the climate? Exploring 'authorized' voices in traditional and new/social media. *Maxwell Boykoff, University of Colorado*

In this paper (and presentation), I analyze trends in coverage of climate change in traditional and new/social media, and explore contextual elements as well as journalistic pressures that contribute to how climate-related information becomes 'news'. Amidst these trends and conditioning factors, I then focus on two related issues: (1) examinations of who are considered 'experts', authorized through media attention to speak on these issues; and (2) how these play out distinctly between traditional and new/social media sources. These twin considerations seek to (A) make sense of how and why particular climate-related discourses find traction in traditional and new/social media, while others remain muffled or silenced, and (B) understand implications therein. Furthermore, the paper endeavors to explore how power flows through a shared culture, politics, and society, constructing knowledge, norms, conventions and (un)truths about variegated dimensions of climate change via processes of media representations. I argue that these portrayals significantly meld our individual and collective 'ways of knowing' about climate change, and in turn, vitally shape our material and social practices. In other words, the research examines how (un)authorized voices evident in various media sources shape negotiations of truth claims, and management of the conditions of our lives and livelihoods in the face of anthropogenic climate change. In the context of a wider and emergent 'cultural politics of climate change', examinations of mass media representations provide opportunities to contemplate ongoing links and barriers between science, policy and the public. The ways in which media sources represent different aspects of climate change - from what role humans play in the changing climate to how to effectively construct and deploy climate adaptation funds - shape cultural interpretations via citizen perceptions and deliberations for action. Numerous elements - contested and complex - contribute to these interactions, as media practices stitch together formal science and policy with everyday activities in the public sphere.

Communication between media and researchers on climate change issues. *Yoshie Maeda, The University of Tokyo*

The Media Forum on Climate Change in Japan was started in 2009 to promote better communication between researchers on climate change and journalists specializing in environmental issues. The original organizers of the forum were researchers mainly from the natural science fields, who often experienced gaps between their research outputs and the articles on their outputs as reported by mass media. They feel that global warming projections and the impact studies tend not to be covered as they wish in mass media, while journalists are often confused by their unassertive explanations. Filling the gaps between them is a necessary process to provide more accurate and reliable information on climate change to the public. At the first forum meeting in March 2009, 32 researchers and 39 journalists gathered to identify these gaps as the first step to the goal. According to a questionnaire survey among the participants, 66% of the participating researchers considered reports by media on climate change to be exaggerated or somewhat exaggerated, while only 37% of the participating journalists answered so. In the discussion session, many scientists suggested journalists to write more about the assumptions of each study and uncertainty of its results, not only its brief conclusion. On the contrary, the

survey showed that more than 80% of the participating journalists considered writing about assumptions and uncertainty as one of the difficult matters in reporting climate change studies. The second media forum meeting in March 2010, organized by both researchers and journalists, chose a more specific topic, "+2 *C", which is considered the scientifically derived temperature target in the Copenhagen Accord. The second forum aimed to identify the real meaning of "+2 *C" for climate change from both scientific and policy angles to help journalists obtain a balanced view of the issue. At the meeting, after reviews on the "+2 *C" issues by science and policy sides, experts of the climate change issues and journalists discussed balanced communication of this topic in mass media in the panel session. The details of the discussion at this forum event will be covered in the presentation.

Chairs:

Atsushi Ishii, Center for Northeast Asian Studies, Tohoku University

Midori Aoyagi-Usui, National Institute for Environmental Studies

025. What are East Asian STS theories: Questions, Qualifications, and Strategies

9:00 to 10:30 am

5: 532

What are East Asian STS theories? Is there any actual or even possible East Asian STS theory? Or as a starting point, we may wonder what possible features of the expected East Asian STS theories are. Before we inquire the possibilities of East Asian STS theories, we may have to ask: Can a theory be local or regional, say, East Asian? Since East Asian STS theory is suggested by contrast to Western STS theory, thus, in what sense we say that a theory is Western? Why do we East Asian scholars not satisfy the present situation in which we are applying Western STS theories to East Asian cases? Do we really need East Asian STS theories? This session proposal tries to answers these questions. Ruey-Lin Chen's presentation aims to the qualifications of the intended East Asian Theories. He will examine some expectations to the features of possible East Asian STS theories such as the specially historical and geographical contexts or the East Asian national traditions. Another question, "whether a theory-builder must have an East Asian identity or not?" will also be discussed. He finally suggests that the identification of a theory-builder to the East Asian STS community is an adequate answer and reveals the co-construction of East Asian STS theories and East Asian STS community. Daiwie Fu will discuss the relation between philosophy of science (PS) and STS in East Asia. His position and finding are such that in different ways, both disciplines have things to learn and to study from each other. The nature and characteristics of various East Asian histories and societies would play an important role in bridging these two important disciplines. In addition, questions like "Can STS informed/active philosophers like L.Winner or S.Harding, in the present context, play an exemplary role for East Asian philosopher of science/technology?" will also be discussed. Finally, discussions in this paper might also contribute to the basic question of this session: what are East Asian STS theories? Chen Jia-shin's presentation, by introducing the concept of assemblages, is a response to the discussion, raised by Daiwie Fu (2007) in the first issue of the EASTS journal, of East Asian distinctiveness in terms of STS theories. This concept may be used to analyze issues of science and technology in a way that both addresses East Asian distinctiveness and characterizes the phenomena of deterritorialization. Masaki Nakamura, Ryuma Shineha, Arisa Ema, and Togo Tsukahara will present a comparative study in East-Asian STS journals. In their paper, the topics appeared in the Japanese STS journal and the EASTS journal are analyzed comparatively. As the result, it indicates that the two journals had different interests. This also seems to show that there are differences in STS culture in different countries, such as those in Korea, Taiwan, and China. They think that it will be necessary to investigate the journals and cultures of other Asian countries' STS to map East Asian STS comprehensively, and this will contribute to the emergence of East Asian STS theories.

Participants:

A reflection on the theory-building of East Asian STS. *Ruey-Lin Chen, Department of Philosophy, National Chung-Cheng University*

This paper reflects the theory-building of East Asian STS. Why this problem? As a new academic field, STS was introduced to East Asia about in the 1990s. It has been rapidly rising and has an explosive growth during a short period not over decades. As yet several characteristics appear in East Asian STS. First, most STS researches investigate and analyze local and contextual cases in East-Asian regions such as Taiwan, Japan, China and others. Second, most STSers have stronger practical or pragmatic interests. They hope STS researches can be immediately applied to solve actual problems in East Asian society. However, East Asian STSers still need theories to analyze data and at the same time they have a strong desire to develop an East-Asian style of STS, which is independent of Western STS to a degree. In what sense, East-Asia STS can be independent of Western STS? Is it enough to do such a claim, if East Asian STS researchers only apply Western theories to local cases? Whether they need to construct East-Asian STS theories which are different from theories in Western STS or not? Can there be the so-called East-Asian theories? Are STS theories allowed to be regional or local? If so, what are the qualifications of East Asian STS theories? What are the strategies to develop East Asian STS theories? This paper is to answer these questions in a general level. I begin with discussing some expectations to the features of possible East Asian STS theories such as the specially historical and geographical contexts or the East Asian national traditions. Yet I shall point out that the two expectations have their respective problems. Another question, "whether a theory-builder must have an East Asian identity or not?" will also be discussed. If the qualification of an East-Asian STS theory is that its builder must have an East Asian identity, then this seems to exclude possible contributions from non East Asian scholars. I finally suggest that the identification of a theory-builder to the East Asian STS community is a more inclusive answer. And I shall reveal the co-construction of East Asian STS theories and East Asian STS community.

A Cross Road between Philosoply of Science and STS in East Asia. *Daiwie Fu, Institute of STS, National Yang-Ming University*

Philosophy of science has a longer history of studies than STS in East Asia. However, some observes that recently, STS in East Asia might have a more vigorous growth. Both disciplines use methods and approaches belonging in humanities and social sciences, and both takes science, technology, and their histories as their respective research objects. Besides, some researchers even move back and forth in between these two disciplinese. Yet, intellectual exchanges and communications between these two disciplines are generally less than expected. Worse, sometimes these two half-sisters dislike each other. This paper begins with a short survey of the relations in South Korea, Taiwan, and possibly in Japan and China as well. Then the representations of each other and the current states of these disciplines will be discussed. In general, my position and finding are such that in different ways, both disciplines have things to learn and to study from each other. The nature and characteristics of various East Asian histories and societies would play an important role in bridging these two important disciplines. In addition, STS questions like "Can philosophers like L.Winner or S.Harding, in the present context, play an examplary role for East Asian philosopher of science/technology?" will also be discussed. Finally, discussions in this paper might also contribute the basic question of this panel: what are East Asian STS theories?

Assembling and Transplanting: The Example of Harm Reduction Policy in Taiwan. *Jia-shin Chen, University of California, San Francisco*

This presentation is a response to the discussion, raised by Daiwie Fu (2007) in the first issue of East Asian Science, Technology and Society: An International Journal (EASTS), of East Asian distinctiveness in terms of STS theories by introducing the concept of assemblages. This concept may be used to analyze issues of science and technology in a way that both addresses East Asian distinctiveness and characterizes the

phenomena of deterritorialization. The perspective of assemblages is substantiated by a case study of policy transplantation. In 2005, several public health measures were implemented in Taiwan to control the rampant HIV/AIDS epidemic among injection drug users. These measures, including methadone maintenance treatment (MMT) and needle-syringe program (NSP), were modeled on harm reduction projects in other places, such as Australia and Hong Kong, which had claimed success in the prevention of HIV/AIDS transmission. These transplanted programs involved not only bureaucratic cooperation and organizational coordination. More significantly, they also included policy know-how and related technologies on which these programs are built. However, transplantation is not sheer duplication. It is more a contingent and improvisational creation than a regulated and predictable reproduction. As a result, the author argues that the idea of assemblages, originating in Deleuze and Guattari's works but elaborated by various scholars, better describes the complicated process of policy transplantation. This idea has been widely applied in analyses of different themes and issues. By formulating Taiwan's harm reduction policy as an assemblage and its transplantation as a process of assemblage formations, the author offers an analytic perspective in which Euro-American impacts are provincialized and the East Asian distinctiveness illuminated. Moreover, this perspective also seeks to resolve the tension between singularity and universality, center and periphery, the global and the local.

Network Analysis of Keywords for Envisioning East Asian STS: A Comparative Analysis of STS journals. *Masaki Nakamura, Osaka University*; *Ryuma Shineha, Kyoto University*; *Arisa Ema, University of Tokyo*; *Togo Tsukahara, International Cultural Studies, Kobe University*

In a position paper that appeared in the first issue of East Asian Science, Technology and Society: an International Journal (hereafter abbreviate EASTSj with small j, to avoid confusion with East Asian STS, hereafter EASTS), Daiwie Fu (2007) pointed out that EASTS should not be a mere application of the Western STS to East Asian case studies. Instead, Fu proposed EASTS would be able to provide fresh STS perspective to the Western oriented STS, by focusing on the local contexts. Many STS scholars in East Asia would agree and share with Fu's view, however, we have one question: what are the East Asian perspectives? In order to find answers, we examine the current situation of EASTS by conducting a network analysis on high frequent keywords in STS journals. In this presentation, we will show preliminary results of comparative research on EASTSj and the Journal of Science and Technology Studies (jSTS, in Japananese). The results exhibited different tendencies observed in topics and fields even between the jSTS and EASTSj. In jSTS, keywords on advanced techno-sciences (nuclear power, nanotechnology, etc.) and mass-media are frequently appeared. On the contrary, EASTSj displays a richness of historical studies, particularly on colonial science, and higher frequency in "biomedical science" observed in relation to keywords such as feminism, body, family, and globalization. This analysis is carried out as a part of research collaboration at STS Network Japan, and now conducting further comparison with Science, Technology and Human Values (ST&HV) and Social Studies of Science (SSS) in order to consider differences to jSTS and EASTSj. By the time of this presentation, we will be able to give more results of the comparative analysis on topics and keywords on four journals. We are now also proposing members of the Taiwan, Korean and Chinese STS communities for collaboration. In East Asian STS, barrier is their vernacular nature. For example, STS in Korea is famous as definitely rich in contents, but mostly vernacular, compared to Taiwanese STS community. STS community in mainland China in Chinese is established and authorized academic field known to be set in the different intellectual/institutional context both from the West and the rest of East Asia. We are hoping to know each other more for much active STS in East Asian Community. So we have asked East Asian colleagues to participate our project to figure out characteristics of East Asian STS and asked suggestions and ideas for future collaboration. In East Asia, we should enhance our mutual understandings through STS, with reserving language/cultural diversity, and this is one of the challenges for East Asian STS community.

Non-Presenting Author:

Suzanne Moon, University of Oklahoma

026. Technologies of Democracy (1): Democratic Experiments

9:00 to 10:30 am

5: 533

This session (part of a 3-panel project) proposes to consider democracy as the outcome of processes that need to be studied in their own right. STS provides useful tools to study democracy as the product of heterogeneous technologies and experimental formats, made up of political theories, social science knowledge and methods and material arrangements. The phrase "Technologies of democracy" refers to devices used to produce citizens, public issues, ways of dealing with them, and sometimes democracy. Some of them, like voting systems, are well established - albeit occasionally controversial. Others - such as participatory mechanisms - are being developed to answer complex, controversial or elusive public issues. In any case, the relationship between technologies of democracy and the issues they are meant to deal with is not a given. Rather, the processes through which technologies of democracy are attached to particular issues, or can circulate from one issue to another need to be analyzed. Papers in this session may consider one of the following items to analyze technologies of democracy: Technologies of democracy as experiments in democracy Experiments are a key site for the deployment of technologies of democracy, one where social scientists, policy experts and activists hope to demonstrate particular political outcomes (e.g. social laws that govern the behavior of citizens, the ability of lay people to intervene in scientific activities, the feasibility of democratic forms of life). Analyzing technologies of democracy as experiments allows us to draw connections with the work of STS on experimentation in technoscience, and to pay special attention to the production of social scientific knowledge. Controversies about technologies of democracy Technologies of democracy might be resisted by the people expected to be involved in them, or become incompatible with the issue they are supposed to deal with, or with the collective they are expected to enunciate. Indeed, the ability of technologies of democracy to perform democracy is often contested, and this seems to apply in equal measure to conventional mechanisms like elections and more innovative devices such as experiments. For students of technologies of democracy, controversies are opportunities to render explicit the machinery of 'democratization'. Expertise on technologies of democracy Experts "of" democracy intervene in setting up technologies of democracy, and contribute to make technologies of democracy circulate in academic, economic and political spheres. Analyzing the production of expertise on technologies of democracy offers insights into the solidification of these devices, their integration into markets, and the epistemologies underpinning their operation. Relationships between technologies of democracy and political theories Technologies of democracy enact the political, and, as such, have been the subject of concern for political theorists. Following STS work on the links between economics and the practice of economy, one can investigate how technologies of democracy are shaped by and in turn shape political theories. Furthermore, studying technologies of democracy may also be a way of engaging with certain topics in political theory (e.g. the politics of problem-solving, the limits of popular sovereignty and post-territorial politics).

Participants:

Industrial Democracy as an Experimental Form. *Javier Lezaun, University of Oxford*

For most of the twentieth century, the workplace was the privileged site for experimenting with new forms of democratic life. It was by reorganizing the spaces, processes and group dynamics of work that key political and intellectual movements sought to usher in novel, more radical versions of democracy. In post-war Western Europe, this link between work, production technologies and political experimentation was pursued most forcefully under the aegis of 'industrial democracy', a multi-national program of research and intervention dedicated to embedding participatory decision-making in work settings. In the

1960s and 1970s this program was responsible for a series of 'crucial experiments' in the feasibility of work democracy. This paper draws on two historical examples of 'industrial democracy' in action - the Norwegian program to transform the political organization of merchant ships and the Volvo plant redesign in Sweden - to explore a series of interrelated questions about the content and context of experimental democracies. How was 'democracy' transformed into a technical problem? How was it made amenable to techniques of social scientific investigation? How did these experiments end, and why were their demonstrative effects limited? How did the artificial democracies created under experimental conditions interact with the institutions of democratic corporatism that dominated the political life of these countries at the time? The presentation pursues a few broad analytical themes. What is involved in turning a form of political life into a technical matter, and what is the purchase of themes and concepts developed by science studies to understand experimental practices on an analysis of political experiments?

Manufacturing engagement. Car makers in search for a new citizenship. *Stève Bernardin, Université Paris I, CRPS*

The automobile has long been associated with individualism. Advertisement surely played a great role in that process. We argue, however, that manufacturers deployed other means, not only to convince, but also to stay connected to popular demands as regard to speed and freedom. It was even more true during the interwar period, when car makers faced an increasing problem of traffic accidents. How did they work not to lose their customers' confidence at that time? We propose to answer that question through a detailed analysis of national conferences organized by manufacturers in the interwar period, in order to foster public engagement on the main issue of traffic safety. The so-called « Hoover Conferences » on traffic safety have already been studied by historians and STS specialists like Daniel Albert and Peter Norton. Here we want to further investigate the preparation and minutes of the conference, with respect to historical material gathered from the federal government, associations and private companies. The analysis of the conference helps to understand how it was prepared, by whom and for what purpose. It shows that organizers initially looked for options to previous approaches of the safety problem. Instead of laws proposed by experts and social reformers, they argued for public debate to consult with citizens. Through open discussions in small group committees, the organizers finally reached a consensus among participants. Such an experiment in democracy was not called a hybrid forum at the time. Its study however shed light on interesting experiments taking shape when a new social problem emerge. It also reveals the role played by industrialists in the opening of public debates, a theme usually underestimated in STS, without falling into the trap of a priori manipulation or obscure influences. Sure, manufacturers have an interest in knowing who is legitimate to speak for safety, but they do not completely master the debate, as we plan to show in our presentation.

General Vara del Rey Square: An experimental device for the construction of cosmopolitical neighborhoods. *Fernando Dominguez, NYU*; *Uriel Fogué, Elii Architects*

Over the last decades, the seemingly unceasing revolution bio-technologies, the increasingly obvious dependence of our economy and ways of life on rapidly decreasing fossil fuels and natural resources, or the unbeknown risks raised by climate change, have revealed the extent to which contemporary politics is no longer a question of governing and reconciling different human interests, but a question of cosmopolitics involvig the participation of a vast array of nonhumans beings and materials artefacts, such as architectures, technologies, viruses or CO2. (Jasanoff 2004; Latour 2004; Bingham and Hinchliffe 2008; Law and Mol 2008). Yet, how can we build ways of being and living in the age of cospolitics? This paper presents a case study: an arquitectural design—a public space—, as an experimental device for building cosmpolitical neighbourhoods. The square, which will be built in the centre of Madrid, is designed to act as an interface to connect spatially and temporally distant agents (e.g. solar radiation, present and future human citizens, energy, rain water, garbage, capital) through a series of visualisation devices (that will make these agents co-present in the space of the square) and participatory and performative devices (that will enable these different agents to mutually influence one another). We will conlude by arguing that architectural devices, such as the General Vara del Rey Square (elii architects), should be seen as forms of material politics that define and enact the clauses of a novel cosmpolitical contract.

Chair:

Brice Laurent, Ecole des Mines de Paris

027. Post-genomic medicine: redesigning and reframing the socio-technical fabric

10:45 to 12:15 pm

12: 1212

Genomics and molecular genetics have become major components of contemporary biomedicine. Promoters of post-genomic medicine promise a revolution in all areas of clinical practice ranging from diagnosis to prognosis and therapeutics. Indeed, post-genomic medicine has been hailed as the future of medicine. From personalized medicine to genomic markers of disease and responses to therapy, the results of the application of genomic technologies are expected to be wide-ranging, substantive and rapid not only from a clinical point of view, but also from a social, political and cultural perspective. While critics insist on the fact that to date few clinical applications can be directly attributed to breakthroughs in molecular genetics and that, consequently, post-genomic medicine retains the status of a promissory note, the number of genomic tests and applications grows steadily and, most importantly, key aspects of genomics increasingly permeate biomedical thinking. Post-genomic medicine, however, is less a descriptive label than a buzzword, more a rallying cry for a number of patient and industry coalitions than a detailed promissory note. As such, it carries multiple connotations. The biomedical literature contains a large and rapidly growing number of articles focusing on novel entities such as "biomarkers", "targeted therapies" and "molecular signatures" that are increasingly understood as constitutive elements of a broader undertaking aiming at designing therapies "tailored" towards individual patients. Indeed, post-genomic medicine is often conflated with personalized medicine, a form of predictive medicine that focuses not on disease symptoms, or even life-style risks, but on molecular risk factors, thus further consolidating a shift in medical practice from clinically expressed to asymptomatic diseases. The use of genomic tools is predicated on a rearrangement of the relations between the laboratory and the clinic that results in the emergence of large-scale collaborations between public research organizations and novel joint ventures with the pharmaceutical industry and biotech companies. Instead of focusing on future scenarios and projected dangers, the session will focus on the empirical analysis of actual practices, i.e., what's happening now rather than what might happen in a more or less distant future. Papers will center on the conditions of possibility for post-genomic medicine, i.e. on the socio-technical arrangements surrounding the hotly debated translation of genomic into a viable, working technology, and in particular on issues related to the socio-technical regulation of the practices that fall under that rubric. More specifically, a paper will discuss the analysis of genome-wide association studies, a current biomedical research line that provides rich empirical material for investigations of large-scale organizational arrangements that go beyond traditional collaborative endeavors and cut across disciplines and organizations. Focusing on genomic signatures and their application in the field of cancer clinical trials, a second paper will discuss the arrangements and debates that surround the clinical use of these genomic tools and, in particular, how these tests re-configure organizational assemblages such as those presiding over multi-center clinical trials. A third paper will focus on the rhetorical strategies used to market personalized medicine in clinical settings. The final paper will explore the role of post-genomics in prenatal diagnosis.

Participants:

The road to breast cancer genomic signatures: pathways of discovery or regulatory highways. *Pascale Bourret, Université d'Aix-Marseille*; *Nina Kohli-Laven, McGill*

University; *Alberto Cambrosio, McGill University*; *Peter Keating, University of Quebec, Montreal*

In this paper we examine two different strategies — which we provisionally label 'commercial' and 'academic' (or 'discovery oriented') — for producing a new type of molecular tools — 'genomic signatures' or 'gene expression profiles' — that predict the risk of cancer recurrence and response to therapy. These tools are presently being tested in two large-scale validation trials. MINDACT, carried out in Europe, uses MammaPrint®, a 70-gene breast cancer signature developed by the Dutch company Agendia co-founded by researchers of the Netherlands Cancer Institute (NKI). TAILORx, conducted in North America, deploys OncotypeDx , a 21-gene breast cancer signature developed by Genomic Health, a US company. While both tests are thus commercially available, their development and circulation embody two quite distinct strategies. A brief list follows. Oncotype analyzes material taken from paraffin-embedded samples, the standard technology used by pathologists, whereas MammaPrint requires fresh tissue samples and thus a change in the pathologists' routine. Oncotype uses a technique (RT-PCR) with widespread replicability whereas MammaPrint has opted for the more complex microarray technology. Oncotype was developed and validated using samples collected during nation-wide clinical trials, whereas MammaPrint's developers resorted to locally available collection of frozen specimen. Oncotype gives results in a numerical scale that can then be interpreted by the clinician, whereas MammaPrint provides a qualitative yes/no answer that brooks no interpretation. Agendia obtained clearance for MammaPrint from the FDA, whereas Genomic Health has chosen to circumvent the FDA and embed Oncotype in the guidelines of the two major US cancer guideline developers (ASCO and NCCN). These differences all relate to a key distinction between these two tests. Oncotype began as a commercial platform: Genomic Health assured itself of the analytic validity of a generic form of the test and its commercial penetration before targeting a disease: the company did not discover a signature, they constructed it by asking users at every step what clinical question they wanted the signature to answer and what data would be credible in that regard. Mammaprint developers discovered a signature and subsequently went looking for validation. This difference, we will argue, is critical to understanding recent shifts in the configuration of biomedical practices and alliances.

Constituting individuals and groups in personalized medicine. *joan Fujimura, university of wisconsin, sociology*; *Ramya Rajagopalan, University of Wisconsin-Madison*

The individual and the group are tightly imbricated in research approaches being deployed towards the goal of personalized medicine. This paper examines the constitution of the individual and the constitution of groups in two sets of biomedical genomic studies used to develop personalized medicine. The first are studies currently being conducted in pharmaceutical companies that use the methods and results of genome-wide association studies (GWAS) to experimentally examine who can benefit from specific drugs and who cannot. In current clinical trials, these studies are first bypassing the search for actual genes connected to disease by using the SNP-disease associations produced by GWAS. Second, they are conducting analyses that combine "phenotypic" biomarkers with "genotypic" biomarkers (SNP data). We compare these studies with studies conducted in non-profit research institutes and clinics.

Marketing the promise of personalized genomic medicine in the clinic. *Michelle McGowan, Case Western Reserve University*; *Jennifer Fishman, McGill University*; *Marcie Lambrix, Case Western Reserve University*

"Personalized Genomic Medicine" (PGM) is one of a number of labels that have emerged over the last twenty years to capture the goal of using molecular genetic tools to develop individualized, predictive, and preventive health care interventions. The widespread acceptance of PGM as a new paradigm for clinical medicine is reflected in the pioneering academic medical centers in the United States that have already developed personalized medicine and individualized therapy programs in anticipation of the promises of translational genomic research. While few clinical settings currently offer genomic-based medicine to patients, those that do will be instrumental in defining PGM as it moves towards mainstream practice. This presentation will explore the ways in which the clinical vanguard conceptualizes PGM through rhetoric. Our rhetorical analysis focuses on PGM clinic websites, to explore if and how the rhetoric employed by clinical personalized medicine and individualized therapy enacts a "new" approach and/or rebranding of the biomedical enterprise. This rhetorical analysis lays the groundwork for exploring the socio-cultural and ethical implications of the uptake of the multi-dimensional concept of "personal" and how it may be realized in practice using new technological developments.

Post genomics, antenatal medicine, and the cell identity problem in non-invasive prenatal diagnostic technologies. *Susan E. Kelly, University of Exeter*

This paper examines the role of post genomics in the problem of bringing fetal cell-based noninvasive prenatal diagnosis into clinical application. The prenatal period is of increasingly intense commercial and clinical interest, and represents a useful arena in which to examine dynamics of post genomic medicine. Fetal cells in maternal blood have long been a target for development of prenatal diagnostic clinical applications, but have met with limited success. Although the search for a truly fetal-specific marker around which to organise new clinical practices remains at the forefront of such research, no candidate has been validated to date. The history of fetal cell isolation research, pursued since the 1970s, is tightly linked to developments in techniques and instrumentation in cell sorting and DNA analysis. A considerable amount of research has been devoted to the problem of identifying fetal specific markers that, in conjunction with available and rapidly developing cell separation instrumentation, would meet existing standards of accuracy to replace invasive diagnostic procedures. A further goal has been to facilitate dispersion and standardisation across clinical locations, as prenatal diagnosis represents a large and expanding global market. This paper examines the emerging dynamics of these socio-technical assemblages and post genomics studies of fetal cell specific markers by focusing on a laboratory in the west of England that has been pursing post genomics approaches as part of a large scale European collaboration to advance and standardise maternal blood based fetal diagnostic techniques.

028. Discourse and Environments

10:45 to 12:15 pm

12: 1213

Participants:

Animating the Insect: Time and Tempo in Hayao Miyazaki's "Nausicaa: The Valley of the Wind and Guillermo del Toro's "MIMIC." *Charles Zerner, Sarah Lawrence College*

In Timescapes of Modernity: the Environment and Invisible Hazards, Barbara Adam, sociologist of temporalities in agro-industrial production processes, slow food cultures, and scientific laboratories, asserts: "We, along most other living beings, are constituted by a multitude of circa rhythms. These rhythms range from the variety fast firing of neurons to the heart-beat, from digestive to activity and rest - cycles, and from the menstrual cycle to the larger regenerative processes of growth and decay, birth and death." Building upon Barbara Adam's sociology of the role of temporalities in contemporary bio-sciences and agro-industrial production systems, specifically the contrast between industrial clock-time and circadian rhythmicity, this paper analyzes the temporal dimensions of insect representations in Japanese animation and in contemporary science fiction films. Entomological representations --- their temporal rhythms, insect gestures, anatomies, forms of flight, attack, orientation and movement -- are viewed and analyzed in two major feature films, Hayao Miyazaki's "Nausicaa : the

Valley of the Wind" and Gillermo del Toro's science fiction-horror film on viral epidemics, genetic engineering, and augmented evolution entitled "MIMIC." Through an analysis of the historical context in which these two very different films were produced, one in the 1980s and the other in late 1990s, and analysis of the divergent tempos of bodily movement in these two filmic works, this paper makes explicit links between varied tempos and historical moments in structuring the embodying ideas of nature, the natural, the machinic, and the human.

Dreaming the Butterfly: On the Symbolic Power of Organisms in Environmental Conflicts. *Christopher Henke, Colgate University*

Endangered spotted owls are blamed for the loss of logging jobs in Oregon; ranchers near Yellowstone National Park protest the reintroduction of wolves to the park; opponents of wind power decry the impacts of windmills on local bird populations. In each of these cases, organisms are at the center of environmental disputes, providing a focus for conflict between human actors in a wide variety of environmental issues. Academic attention to environmental problems, and especially the interaction of experts, policy agencies, industrial interests, and activists, has highlighted the importance of environmental discourses in debates over whether an environmental problem exists and what ought to be done about it. However, despite the importance of organisms, especially how they are portrayed and debated among humans, for understanding the discursive terrain of environmental conflicts, very little has been written about the role of organisms in these cases. This topic is important for understanding how organisms are discursively constructed as cultural objects, and organisms have an interesting, if paradoxical, quality that make them especially important for understanding environmental conflicts: though organisms appear to us as agents (they appear to make choices or even exhibit motives and intentions), humans can interpret this "agency" in myriad ways. This combination of seeming agency and discursive flexibility provides organisms and the attributions humans give to them a kind of symbolic power that can be deployed by humans in a wide variety of discursive forms. The data for my argument comes from an episode I term here, "the monarch butterfly controversy," where widespread public debate about the environmental safety of transgenic corn followed from reports that pollen from transgenic corn harmed the larvae of the monarch butterfly. Relying on interviews with key informants in the controversy as well as content analysis of media reports, I use the monarch controversy to examine the use of the butterfly as a symbolic resource for both supporters and critics of the environmental consequences of agricultural biotechnology. Christopher Henke Department of Sociology and Anthropology Colgate University 13 Oak Drive Hamilton, NY 13346 315-228-7076 chenke@colgate.edu

Enviroculturalism: Natureculture Dissonance and the Makah Whaling Controversy. *Jessica Lyons, Rensselaer Polytechnic Institute*

This project examines the controversies surrounding whaling by the Makah Nation, a federally recognized Native American community on the West coast of the United State. This project introduces the concept of "natureculture dissonance" to analyze the natureculture clashes concerning contemporary whaling. The term Natureculture was introduced in anthropology and cultural studies to refer to lifeways particularly marked by inseparable binding between nature and culture. Just as "cognitive dissonance" describes the discomfort and resulting behaviors that occur when one holds two or more psychologically incompatible ideas, natureculture dissonance describes the discomfort and resulting behaviors when there is a clash between incompatible naturecultures. In this project I investigate how the Makah Nation mobilizes resources (ranging from rhetorical resources to harpoons to cultural capital) in response to this dissonance. Rather than reduce the conflict to a simplistic ethical calculus (for example the claim that animal rights universally trump human need and vice versa), my work emphasizes the complex synthesis that each natureculture represents, including the possible heterogeneity with each group. As an alternative to reductive ethics, my goal is to use these fuller, more dynamic portraits to develop an "enviroculturalism" that can encompass the value of cultural diversity as well as that of biodiversity, and produce a more nuanced understanding of transcultural environmental conflicts. I plan to utilize the enviro cultural framework as a plausible alternative for approaching what I call natureculture dissonance and for providing avenues of communication between indigenous people and environmental groups.

Exploring Nature's Limits: Globalized Reflections on Race, Gender and "the Wild". *Wairimu Njambi, Florida Atlantic University*; *William O'Brien, Florida Atlantic University*

The conceptualization of "Nature" is a persistent theme that binds together STS, feminism, and environmental studies. In its historically taken-for-granted form, the idea of Nature masks power relations that privilege particular institutions and perspectives while devaluing and even excluding others. Our contribution to a critique of this exclusive Nature emerges from a co-taught course called "Honors Race, Gender & Environmentalism," taught in spring 2010 by the two authors. Informed by specializations in feminist science studies and environmental studies, our analysis begins in the context of environmental history with the emergence of an idea of Nature as "untouched" landscapes, separate from Society. While this Nature/Society dualism has long been criticized from within STS, feminist, and from environmental justice perspectives (often interwoven), the discourse of Nature has been resilient and durable. Our critique emphasizes unresolved tensions by reflecting on our own positions in relation to Nature discourse in globalized contexts. Emphasizing Nature as "environment," we explore how landscapes presumed to be "places for all" - such as National Parks - can also continue to be culturally exclusive spaces to which some more clearly belong than others. Our discussion begins with an assessment of Ken Burns's documentary, The National Parks: America's Best Idea, which relies on entrenched images of U.S. Nature as "the wild" while also attempting a more culturally inclusive narrative that embraces difference. We assess his success in this endeavor by accounting for our own Nature relationships and experiences in U.S. and Kenya context. The film's assumption of a welcoming Nature of leisure fits well with the National Parks narrative and is the experience of one author, U.S. American, white and middle-class - a Nature of restful silences in camping and in childhood excursions into "the woods." This positive experience stands in stark contrast to the other author's sense of Nature as a site of exclusion. For this author, a Gikuyu female with rural Kenyan roots, whose food was cooked over an open fire (with firewood gathered from the local environs) and water drawn from a nearby river, separate concepts of Nature and Society did not exist. In Kenya, the North American idea of unsullied Nature was a colonial import, imposed through national parks and game reserves that excluded Africans, both from accessing resources and by privileging foreign tourism. The Nature idea was also imported through institutions like the Girl Guides, which called upon Kenyan girls, such as the author, to undertake excursions into Nature. Like the masculinizing project that promoted reinvigoration and personal challenge in America's "wildlands," the Kenyan version transposed an ideology of Nature as a separate sphere. By centering a counter-narrative based on lived experience, we hope to problematize the globalized durability of Nature's conceptualization.

Cool Biz: an STS Analysis. *Stephen Healy, UNSW*

The Japanese Government's Cool Biz campaign launched in 2005 is one of a suite of initiatives, Team Minus 6% (http://www.team-6.jp), designed to help Japan meet it's Kyoto 6% GHG reduction target. While Cool Biz, which focuses on setting office air conditioners at 28 C in summer, is still a source of some domestic dissatisfaction it has inspired analogous campaigns elsewhere including at the UN (http://ourworld.unu.edu/en/cool-united-nations/). Cool Biz is

interesting for a number of reasons. Counter to a significant global trend in which the rapid spread of air-conditioning acts to shape built environments and thermal behaviours in environmentally detrimental ways (Healy, 2010) Cool Biz is one of a limited number of initiatives progressing the adaptive paradigm promoting adaptive approaches to thermal comfort (i.e. using natural ventilation, passive cooling techniques and clothing appropriate to season). Cool Biz has been particularly effective in this regard giving rise to new corporate dressing codes and purposively designed lines of Japanese business clothing (in January, 2010 Japanese tie manufacturers and wholesalers requested the government cease Cool Biz because it was damaging their business - see < http://search.japantimes.co.jp/print/nn20100114a8.html>). However, contrary to the success of Cool Biz in shaping collective behaviours and practices Japanese environmental policy is better known, outside of Japan, for an emphasis on technological innovation. In Europe, the US and Australia policy focused by technological innovation is commonly in tension with policy focused on behavioural change rather than complimentary to it. This paper will review the Japanese Cool Biz experience and, building on Healy (2010), summarise its contribution to the broader push to promote adaptive approaches to climate change. The analysis will also examine how the Cool Biz case study suggests ways in which some western (STS) norms may be inappropriate for Japanese case studies and require further attention to the subtleties of Japanese culture. Healy, S., (2010) 'Air-Conditioning and the 'Homogenisation' of People and Built Environments', in Comfort in a Lower Carbon Society Shove, E., Chappells, H. and Lutzenhiser, L. (eds), Routledge, pp 7-17.

Conceptualizing Sustainability Dynamics with emphasis on a system's Transition phase. *Niranji Nadeeka Satanarachchi, The University of Tokyo, Japan*; *Mino Takashi, The University of Tokyo, Japan*

Conceptualizing Sustainability Dynamics with emphasis on a system's Transition phase Niranji Satanarachchi, Graduate Student, The University of Tokyo Mino Takashi, Professor, The University of Tokyo Abstract Based on the proposition that sustainability, instead of a past, present or future state is a continuous process which evolves over time, the thesis aims to understand what the perception of dynamics would specifically mean in relation to sustainability, hence the study illustrates a logical process of conceptualizing what we call as sustainability dynamics, to reach a conceptual model which has the potential to frame the concept within firm scientific grounds. Through evaluating various complex socio-environmental systems on one hand from the viewpoint of their natural evolutionary patterns, and on the other hand, through the lens sustainability/unsustainbility principles, concepts of sustainability sphere, sustainability path, patterns of movements along the path and finally dimensions which form the sustainability sphere and determine the path movements within, were developed in various stages. The basic model of sustainability sphere and sustainability path is defined reaching from the internal dynamical forces and external dynamical forces. Internal forces were identified to be the ones which govern the functional movements or dynamics within the system despite whether they generate sustainable conditions or not. The external forces were identified to be straight away linked with sustainability characteristics or principles inherent or concerned with a certain system. In addition, with the support of few contextually different cases the movement patterns which are created by these forces along the path of a system, in other words path dynamics are characterized in to two main forms, namely Horizontal Process Dynamics (HPD) and Vertical Process Dynamics (VPD). In this particular study, the theorizing process of this in specific context of transition from one particular system state to next which include both HPD and VPD will be discussed, using a casestudy as the method, to reflect societal transition to support the raised concepts in detail. The study would be significant for the conference in terms of its effort on integrating holistic view point on sustainability in to the bottom most actual societal movements within a conceptual and scientific framework.

029. Economic and Market Studies

10:45 to 12:15 pm
12: 1214

Participants:

Flexible Economics. *Michael Reay, Swarthmore College*

This paper investigates the role that economic experts played in the United States during the late 1990s - possibly the high-water mark of the global expansion of pro-market policy regimes. It focuses only on academically trained economists, but it looks at them in a wide variety of different work settings, including elite business and economics programs, less prestigious teaching schools, transnational, federal, and state organizations, think tanks, law firms, financial institutions, and private corporations. It uses interviews with experienced practitioners to build up a picture of the overall anatomy of the profession, paying special attention to three things: (1) what economists did in different kinds of job, and how their expert knowledge framed problems and excluded others from decision-making; (2) how their use of economics was constrained by the power of other actors and groups, by levels of lay familiarity with economics, and by the specific 'core' content of economic theories, and; (3) how these constraints combined with fundamental uncertainty to make the influence of economics highly flexible, i.e. dependent as much on local politics as on any inherent tendency of academic models to be pro-market. This picture of a variably-influential core of expertise adds to recent STS work on the 'performativity' of economic theory in several ways; (1) it traces more closely than before the 'thread' of theory-based economic expertise connecting academia to multiple work arenas, hence bringing performativity models into dialogue with the broader literature on the sociology of professions; (2) it starts to explore the routine operation of economic expertise in a stable, already-marketized institutional context, as opposed to the more frequently studied case of new market construction; (3) it connects studies of economic expertise to the wider STS literature on knowledge utilization and the possibility of public participation in science-based decision-making.

Legal Expertise in Financial Markets: Non-Deliverable Currency Forwards and the Amendment to the Russian Civil Code. *Svetlana Milyaeva, University of Edinburgh*

My research falls within new field of 'social studies of finance' and it is an investigation of a law-making process (including esoteric law, little noticed outside of specialist spheres) and its role in shaping financial markets. Given that it is an enquiry into making of derivatives law and regulation, it is particularly timely, since in the current midst of the credit squeeze and recession derivatives are widely held responsible for the crisis. STS have been investigating legal expertise for years (Jasanoff 2008) and my research contributes to the STS enquiries by exploring the role of such expertise in financial markets. By 'opening the black box' (MacKenzie 2005) of regulation, the research demonstrates how 'just' a concise amendment to Article 1062 of the Russian Civil Code has had significant ramifications for the interbank currency derivatives trade. In my research I used mainly qualitative data obtained by (1) conducting semi-structured interviews with market participants (legal experts in financial regulatory authorities, financial lawyers in banks and in legal firms, brokers and bank traders based in London and in Moscow); (2) analysing a range of documents such as statutes (laws and regulations), typescripts of parliamentary debates, and monitoring financial media coverage. I also used quantitative data in my research: the range of statistics on the interbank currency derivatives trade assembled by the Bank for International Settlement. My study shows that legal amendments made in 2007 enhanced the liquidity of the currency derivatives market and made possible the introduction of netting as a risk management tool by rendering these financial contracts legally secure (these contacts had been classified as gambling transactions under the Russian law since 1998). In that, my

research demonstrates that although regarded as highly virtual, derivatives are, in fact, an outcome of material making; and legal technicalities are crucial for the construction of derivatives markets. Indeed, in the current circumstances of widespread failures in financial markets, thus in the light of the eroded perceived authority of financial expertise, legal expertise is viewed as a remedy: making financial regulation tougher is a topic of current concern. However, my research found that legal expertise is not an objective, 'disinterested' and 'unprejudiced' authority as it claims to be (Latour 2004: 73); it is a product of complex interactions and fierce debates in a context of local legal cultures. The nature of a law-making process as a compromise shapes its outcome - a financial regulation. I observed that a chain of legal compromises resulted in the regulation of derivatives in Russia turning out to be ad hoc and pragmatic, not comprehensive as it had initially been planned. Moreover, associated with regulators' attempts to retain their influence on a market, regulatory competition can cause a delay in much-needed legal changes. As my research showed, a 'turf war' between the Central Bank and the Federal Financial Markets Services in Russia led to the legal debates that lasted nearly eight years, ultimately obstructing the development of derivatives regulation.

Speculating politics: The feedback loop of trust in China's futures market. *Lucia L.S. Siu, Lingnan University*

Markets can be seen as sensitive flow structures, where information and action are intensely synchronized. The feedback loops between knowledge and action in markets are studied under the terms bootstrapped induction (Barnes), reflexivity (Soros), performativity (MacKenzie), and agencement (Callon). Some consider the feedback loops as the Archilles' heels of economic theories, as they may cause infinite regression, or turn market predictions into a chase of moving targets. Others consider feedback loops as a powerful way of social construction, where trust and expectations can enter into positive spirals to establish stable social institutions. Based on ethnographic fieldwork from several cities, this paper provides an account of how China constructs its futures market in less than two decades. The early Chinese futures market adopted a theoretical template from the Chicago exchanges; it quickly fused with a domestic top-down governance structure, and a form of local government-firm cooperation. Policies do not stay away from supply and demand as a distant regulatory framework. Instead, political capital is directly commoditized and enters into an active exchange with information, commodities, and market action. In a futures market "with Chinese characteristics", political capital is the core part of calculation alongside money, information, collective sentiments, and fundamentals. The market feedback loops are highly politicized. This paper demonstrates how a derivative market framework from Chicago can be embedded by the political institution of China, resulting in a pattern of power and wealth distribution that amplifies the local social class structure. As a response to an earlier discussion from Philip Mirowski, this paper illustrates that the social studies of finance, as a branch of STS, can be sensitive about power issues. The performativity thesis does not necessarily justify all existing market models as reasonable and desirable. Keywords: Market embeddedness, political institution, feedback loops, commodity futures, China, commodifying communism, performativity, bootstrapped induction.

The Legal Economic Nexus in the Regulation of Technology. *Victor Pelaez, Federal University of Parana*; *Camila Hermida, Federal University of Parana*; *Huáscar Pessali, Federal University of Parana*

Since the 1970s, the concern of industrial societies over the environmental impacts of technical progress has played an increasing role in political agendas both at national and international levels. The risks associated with nuclear energy, toxic residues, carbon emissions and genetic modified organisms have contributed towards building a social critical vision of the positivist approach to technical progress. In such a context, industrialized societies have created regulatory institutions devoted to the analysis, communication and management of technological risk. Their decisions are based on expert advice in science-based policy and also on the relatively small but growing participation of organized society. The debates surrounding different expert views and citizen claims indicate that such institutions have become an arena of interest disputes in which the social actors involved create room for strategic action. The regulation of technology can be seen as a relationship between economics, law and politics domains. This relationship has been defined by Warren Samuels as a legal-economic nexus through which politics and economics are constituted as interdependent activities that are continually (re)formulating each other. Using the legal-economic nexus as a frame for understanding how regulatory institutions are built and evolve, this communication proposes an analytical framework to enhance our knowledge of the resulting governance on matters of regulating technology. Regulatory institutions are power structures composed by four social control mechanisms - subordination, contamination, emulation and mystification, as proposed by William Dugger. Their synchronic and diachronic functioning is supported by an apparatus of heterogeneous elements of decision making. The most explicit of these elements is general and imprecise regulatory legislation. Its implementation depends on two vectors. First, it depends on specific policies that provide patterns of action to be followed by regulatory agencies. Patterns of action depend, by their turn, on the knowledge available and requested by governmental authorities that will define the analytical methods, the selection and training of experts and the information content to be publicized. Second, it depends on the level of democratic institutions that define the action space for public and private agents concerning the relationship between administrators and organized interest groups. They will also define the discretionary and transparency levels of the decisions taken. The identification and characterization of how these elements are connected shall give us a better understanding of the actors' capacities to block, utilize, stabilize or develop knowledge that is necessary to create certain technological trajectories, market structures and patterns of consumption in industrial societies.

030. Looping Temporalities (2)

10:45 to 12:15 pm

12: 1222

Inviting methodological risks, this double panel attends to temporalities in late-twentieth century and contemporary technoscience. The panel's premise is that temporality is not only multiplied across domains of activity, but also loops as it tacks both forward and backward. The papers ask how temporalities are diversely modulated and recursively related, refusing a notion of "time" as an unmarked directional backdrop to knowledge-in-the-making. Mixing together historical, ethnographical, theoretical and aesthetic modes of scholarship, this panel addresses a set of related themes. First, we take up questions of looping , tacking, and travel between temporalities that bring the past into the present, and the future in the past. Such temporal looping can be encountered in practices of data retrieval, memory, forgetting, archiving, forecasting, investment, retroaction, and speculation. Second, the papers explore the affective dimensions of temporalities in terms of time felt, passed through, anticipated, nostalgic, abandoned, made mobile, and imagined. Third, the panelists collectively offer a performance of disjointed time by following temporal multiplicities, particularly as forms of human time encounter the tempos of plant movement, pharmaceutical durations, architectural remnants, and finance capital. How does the pace of experiments, machines, or organisms become entangled with the speeds and slownesses of governmentalities in the form of red tape, vestigial classification systems, and deadlines? How do technoscientific practices generate, choreograph, anticipate, disrupt, or even erase the encounters of different temporalities -- and to what ends? How is interaction itself imagined and performed in time? Inviting the likes of Bergson, Deleuze, and Benjamin to join in our conversations, the panel aspires to be wary of treating time as merely a unidirectional, measured, and abstract force, and to remain open to the untimely within our own inquiry.

Participants:

Mobile Time and Space: Art Practice that Dislocates the Subject. *Paula Gardner, Ontario College of Art and Design*

This essay queries how mobile experience art can play with issues of time and space to, in Benjamin's term create a radical "passing through" technology or to foment a radical "becoming,". The paper reviews provocative art projects employing mobile and sensory devices that offer unique temporal options (deeply implicated by space) that radicalize the experience of subjectivity. The time/space layers of the mobile experience (Manovich 2003) offer possibilities for both locating and dislocating the self, or "becoming" (Deleuze 1994). Movement through the data of mobile space puts the subject in contact with data from a 'constitutive outside'—allowing for tarrying with temporality. The mobile space enlarges and expands possibilities for desingularization, or dislocating from subjectivity, roles, and representations. The author discusses her art work in the "Portage Project", to argue that mobile environments skirt expectations of time-based media, and undo time/space coherences. One project employing both mobility and sensors, for example, travels the subject from familiar material and sensory experience, to a dislocated "outside" (where she is framed, reframed, deframed)—her expectations for coherence disrupted. This tarrying with dualistic self- rendering enacts Deleuze's notion of inside/outside (1994). Dualism here is revealed as " intimately linked to the dynamism of temporality itself." (Grosz 2005, p 11) The author makes the case that temporality, experienced through senses and via mobile experience, can work to unhinge thought from paradigms of time, space and subjectification (Grosz, 2001 p 70). Deleuze, Gilles. "Postscript on the Societies of Control," October 59, (Winter 1992): pp 3-7. Grosz, Elisabeth. (2001). Architecture from the Outside; Essays on Virtual and Real Space. Boston: MIT Press. Grosz, Elisabeth. (2001). Architecture from the Outside; Essays on Virtual and Real Space. Boston: MIT Press. -- (2005.) "Bergson, Deleuze and the Becoming of Unbecoming". Parallax Vol 11, No 2: 4-13. Manovich, Lev. 2003. "The Poetics of Augmented Space". In New Media: Theories and Practices of Digitextuality, edited by Anna Everett and John T Caldwell, pp75-92. NY: Routledge.

Experience Models and the Liveness of Innovation. *Nina Wakeford, Goldsmiths*

The development of 'user-centred' and 'experience-based' design in the high technology sector has led to a proliferation of ways of representing the user. Experience models - constructions of graphical elements, sometimes accompanied by photos and case studies - have become a mode by which technological innovation is believed to move forward. In this paper I will explore the ways in which experience models function in relation to anticipation of 'what happens next', and their function in terms of an openness to the future - but also consider a non-representational model of experience modelling. Taking up Sloterdijk's project of a history of atmospheres, I will explore the liveness of innovation as it happens in corporate encounters - taking two cases from my fieldwork as examples. The first is a design meeting in which an experience model is created. The second is a short 16mm (celluloid) film loop "Untitled (Inside Intel with Bolex H16) (2009)" which I made as a way of exploring the dilemmas of visualization, temporal politics and the STS-researcher/corporate encounter.

Quitting Time: Narratives of SSRI Disconnect. *Jonathan Michel Metzl, University of Michigan*

This paper asks the surreptitiously complex question, "When is the right time to quit an SSRI? The paper begins with an overview of clinical literature regarding discontinuation of treatment with SSRI antidepressants. It describes the surprising paucity of clinical research, or scientific consensus, surrounding such seemingly straightforward matters as recommended length of SSRI treatment, markers of successful outcome, or protocols for effective withdrawal. The paper then discusses the few popular and medical narratives of drug termination (e.g. Prozac Nation, Beyond Prozac). Central to the analysis are questions of temporality and time. Who decides when it is time to quit, and why? What temporalities are invoked in the breakup (time phased withdrawals, time of life, and so on)? Does time stand still in the aftermath of the affair? Quitting Time then reads this knowledge gap within several specific contexts: that of a pharaconsumerist society that has a much more evolved lexicon for asking for, and ingesting medications then it does for refusing or discontinuing them; and of a biomedical culture enamored with extended drug treatment regimens. The paper concludes by theorizing SSRI discontinuation through psychoanalytic notions of love, loss, and disavowal.

Chair:

Cori Hayden, University of California, Berkeley

031. Historical Review and STS

10:45 to 12:15 pm

13: 1312

Participants:

A Global History of the Academic Degrees: The Importance of the Outsider in the Acceptance of the Ph.D. in England and Japan. *Kevin Chang, Academia Sinica, Taiwan*

This paper studies the social history of the Ph.D. degree in England and Japan, a history in which interestingly foreign students and American institutions played important roles. The Ph.D. was a modern degree (in comparison with the degrees that took form in the medieval university: Doctor of Theology, Doctor of Law, and Doctor of Medicine) institutionalized first in Germany to reward original research in the disciplines taught at the faculty of philosophy (including arts and sciences). When the senate of the University of Cambridge was deliberating in the late 1910s and early 1920s whether to introduce the Ph.D., the proponents argued that it should be done in order to lure American students away from Germany. It was built on the background that America had internalized the value of the German Ph.D. and many of the best American students had received their doctoral training in Germany before they found appointments in American universities. At Oxbridge the Ph.D. remained a degree for the Americans or the foreigners until the late-coming scientific prowess of the US demonstrated to the English the merits of their institutions and degrees (whose German roots then were often forgotten by both sides). The Japanese adopted in the late 19th century the French doctorate system of the time, by which the Doctor of Letters or of Science was not awarded to its receipt until years after he had begun an academic career. When the first American style of Ph.D. was introduced in the 1990s in Japan, its advocates again used the need of foreign students to advance their argument. The home country of the foreign students, Taiwan for example, has taken the American Ph.D. for granted, they argued, so that a Japan-trained student would return home to their disadvantage since he had no doctorate at hand, even though he had completed the doctoral training. Both in the English and Japanese cases, it was in the sciences where the Ph.D. was first embraced. The humanists came to accept it later, and were often pressured by their colleagues in the sciences. This paper thus will delineate the international, if not global, trajectories of the Ph.D. degree. Taking into consideration the origin of the Ph.D. degree and the structural shift of scientific powers, it will investigate the cultural and social values of the academic degrees for different societies or social groups, and disclose the disciplinary differences in response to what may be considered the globalizing trend of the institutions and degrees in higher education in the past.

From Peking Union Medical College at Republic of China to see the multiplex purpose of medical education. *xia yuanyuan, School of health policy and management, Nanjing medical university*

The article describes the purpose and the traditional concept of elite education of the Peking Union Medical College in China at the beginning by literature analysis method; analyzed its attempting in mass education in order to adapt to the situation in China , and from the two program: public health education in

Ting Hsien 、doctor's training , it obtain a lot of achievements and the recognition of the people in China; explore the purpose of medical education suitable for China's national conditions should be multiplex patterns which elite education and mass education co-existence. With the medical technology to the high-precision and advanced high-speed development, the world of medical education has become more and more elite, whether this model is applicable to all countries or not? Hope that through the change of this well-known Chinese Peking Union Medical College to explore the possibilities of multiplex purpose in medical education. Also hope that through the meeting to know the views of some experts

Thinking about expertise: a space for STS in science education. *Shusaku Horibe, University of Wisconsin-Madison*

Although the vast majority of students will never enter science-related professions, the dominant model of science education in America focuses on disciplinary science as though the goal is to produce amateur scientists, in other words, those who understand science from inside disciplinary boundaries. Underlying this assumption is that we need more scientists and that such insider-oriented science education promises learning that is necessary for living with expert scientific knowledge as lay citizen whose lives and interests lie outside of any specific discipline. The dominant model takes for granted the assumption that providing students with disciplinary scientific content knowledge and authentic inquiry experience will contribute significantly to their capacity for engaging with science as outsiders. Yet, this link between understanding science from inside and preparation for life outside is taken as valid on faith. In this paper, I examine the connection between one of the widely proclaimed goals of science education for nonscientists—that of enabling them to engage with science meaningfully in their everyday lives—and the currently deployed strategies for getting there. By using the metaphor of inside and outside and the notion of science expertise developed by Collins and Evans and drawing on studies of lay interaction with science, I first problematize the assumption underlying the currently dominant science education model: that science education for "insiders" is sufficient for "outsiders." Second, by juxtaposing two visions of science education offered by John Dewey and James B. Conant—two educational thinkers who worked to develop science education for nonscientists in the beginning of twentieth century and in the 1950s respectively—I highlight two elements missing in today's science education framework: the explicit attention to the social goals of science education and the opportunity for students to come to grips with science expertise in a socially useful way. Both Dewey and Conant aimed to nurture lay public that can weigh in on the collective decisions regarding how science is used for societal ends, a capacity that depended on the recognition and the appreciation of both the limits and the power of science expertise. The analysis of current and past models of science education raises the normative question of why we should teach 'science' to nonscientists and what aspects of 'science' we should teach in today's society. By analyzing the fundamental assumptions underlying the different educational models for nonscientists, this paper articulates a more active role for STS scholars in science education development and research. More generally, I hope to illustrate parallels between questions posed by STS scholars (e.g. questions about how science affects and is affected by other social worlds) and the questions beginning to be posed by science educators (e.g. what do students need to know in order to participate in socioscientific decision making process?).

Tradition of Pharmaceutical Ethics in the Modern Age --1938: Traditional Japanese Medicine--. *tetsuro Tanojiri, University of Tokyo*; *Saijirahu Buyanchugla, The Graduate School, The University of Tokyo*; *Yoshiyuki Hirono, The University of Tokyo*

Pharmaceutical Ethics in Modern Japan refer to the ethics regarding medical and pharmaceutical products. The act of the pharmacist ethics, one of code of the pharmaceutical ethics, was revised and stipulated in 1998. However, the business ethics, which control the quality of medicine, have maintained their validity since the Edo period. Pharmaceutical Ethics definitely changed into a guild-type of professional ethics due to the appearance of traditional medicinal markets and treatments around the year 1938 Around 1938 in Japan, mainstream medical treatment was not like Western medicines, which still not been completely standardized in that period. It consisted of therapies using traditional Japanese medicines and Japanese pharmacotherapy, mainly employing crude drugs. This presentation considers variations in Nippon Kampo, which most medical doctors and pharmacists practiced. Nippon Kampo was an important part of traditional Japanese medicine, which had been eliminated by the promulgation of the 1873 Medical Act and was restored in the 1920s. It is supposed that there were three elements in the variations of this practice around the year 1938. The first aspect consisted of the scientific and medical elements, which influenced both doctors and pharmacists who were scientifically trained as specialists. Second is the economic element, which influenced both pharmacists and the apothecaries who practiced as medical businessmen from the era of pre-modern Japan. The third aspect consisted of cultural and social elements, which influenced in parallel to the first two aspects. The first two elements are relevant to science and technology and the production of pharmaceutical companies. The third element is related to both Dōjinkai's medical practice in China and the study of ancient medical literature. In conclusion, the Pharmaceutical Ethics used in the period from the Meiji Era to the year 1938 could be business ethics continued from the Edo period. On the other hand, a guild-type of professional ethics appeared after 1938. Therefore, the Pharmaceutical Ethics that have extended to our era had already emerged in Japan at that time.

School Science Education and Views on Science in Japan after WWII. *Toshinori Yamaki, Tokyo Institute of Technology / Fukushima Prefectural Tamura High School*

Introduction In the late 19th century in Japan, science was introduced from the West and developed rapidly as one part of the modernization. The education system including the school science had been provided simultaneously. The views on science peculiar to Japanese had been formed throughout the process. The author discusses the characteristics of the science in Japan how they changed or not after WWII. The Science Boom after WWII While the science education had been promoted among people continuously, its nature changed drastically after the war. The country had to adopt a more democratic system instead of the militaristic one. A science boom came after the war because of the coincidence of three factors; 1) a national motivation, 2) an occupation policy by the U.S., and 3) the people's intension. Actually, the Japanese government considered the lack of power of science as the cause of the defeat of the war. When the American occupiers attempted to democratize the education system in Japan, they emphasized science education. And people welcomed both because they regarded the scientific mind in the same light as democracy. Science education was considered to bring the foundation of Japanese nationals. Such mind of people was the driving force for the postwar rehabilitation and the economic growth, which brought the country a nonmilitary niche in the world. Views on Science in School Education The author surveyed by questionnaire the views on science of high school teachers. Some of the results are as follows: - Science teachers hold rather prototype views on science close to the Mertonian norms, although they put a high value on the pragmatic aspects of science. - Science teachers trust science as a means of problem solving in personal and social scenes. On the contrary, they have little awareness on negative aspects of science in the society. - Science and technology are not distinguished clearly and they are regarded as united 'techno-science'. - Science teachers place the role of personality formation on the learning process of science. Discussion The points concerning the Japanese views on science are as follows: - Science is accepted only as an institutionalized set arranged through the government. The

authority and function of textbooks are great. - Japanese don't regard science as an alien culture but integrate it with their culture. Then they have little interest in the knowledge 'about' science unlike the knowledge 'of' science, and the STS issues are less regarded as topics of science classes by teachers. - Today, the importance of scientific literacy are discussed frequently, but its contents are still not clear. From the above, we need a new methodology to build up the scientific literacy for all people in the technology-based society.

Reference R. Merton. 1973. The Sociology of Science. Chicago: The University of Chicago Press. J. Ziman. 1994. Prometheus Bound: Science in a Dynamic "Steady State". Cambridge: Cambridge University Press. S. Nakayama, et al. 1995. The Social History of Science & Technology in Contemporary Japan. Tokyo: Gakuyo Shobo.

032. Public Participation and Environment

10:45 to 12:15 pm

13: 1321

Participants:

Environment or jobs? Citizen engagement with policy-makers and attitudes toward environmental policy in Central-Eastern Europe.

Stephen Whitefield, Oxford University

Central and Eastern European (CEE) states have been undergoing difficult processes of political, economic and infrastructure transition. Development of effective and equitable processes of environmental governance is an important issue facing these governments and their citizens. But how prepared are citizens to support economic tradeoffs that a commitment to strengthened environmental governance is likely to require? And what difference do citizens' views of government, and how governments perform, make to their support for strengthened environmental policies? Using survey data from a 13-country comparative study conducted by the author in 2007, this paper presents a cross-country analysis of public attitudes about environmental management that considers the impact of citizen engagement with policy makers on levels of support for environmental policies. The paper suggests that the extent of citizens' perceptions of government efficacy, effectiveness of citizen input to governance, and trust in government affect how willing citizens are to support economic tradeoffs that favor the environment. And it considers which country level factors - economic conditions, political development - which vary widely across the region, are associated with different citizen positions on these tradeoffs. The paper suggests that public perception of government performance and responsiveness may have a significant impact on public support for difficult environmental choices that may affect jobs and trajectories of economic development in a challenged region of the world. These factors are considered in light of current public engagement literature.

Public engagement: limits for an equal global implementation.

Julia Guivant, Federal University of Santa Catarina

In the last decade, a growing literature in SSS has been assuming the importance of public engagement for a democratic development of science. In this article I propose to discuss this assumption from the light that a global perspective can bring to the theme. The central argument of the paper is that the consensus in relation to public engament has been constructed considering the pre-existence of a national strong democracy, with consolidated public institutions, and a tradition of representative democracy. These conditions are not explicit in the proposals of public engament, but are their base. Our argument continues showing that without these conditions public engament of science can be used as part of populist approaches. What means direct democracy where representative democracy is still young, corrupted and not trust by the public? And in this case who is the public? In an article published in 2000 I already question this last issue in relation to Beck's fórum proposals. But the risks of not having clear who is the public are deeper in the case of young democracies. In this paper, after analysing the historical develpment of public engagement in the SSS literature, I propose to develop the central argument through a study of proposals of public engagement in Brazil 1) as they were assumed by some NGOs in the case of GMOs and 2) as they are implemented in public hearings as part of the environmental legislation. The theoretical approach for the analysis are the cosmopolitan proposal of Beck and the theory of environmental flows, as formulated by Arthur Mol and Gert Spaargaren. Both perspectives allow to identify and relate national scientific cultures in the dynamic of flows. Our conclusion is that this relation of the public engagement proposals to the scientific national culture shows its power and as well its limits.

Reinventing government for public engagement - the role of design - an Australian case study.

Nina Terrey, University of Canberra Australia

Australian public sector reform over the past two decades has been characterised by the introduction of management strategies from the private sector into public sector organisations in the interests of improved effectiveness, efficiency, transparency and accountability. In this movement the profile of the users of government services has moved from abstract stakeholders to customers. This has seen public sector manager's move towards a customer-centred approach. This customer-centred approach includes building stronger participatory practices in government organisations. This paper proposes that human centred design as a practice enables engagement with the public in the design of public services and policy. This paper is based on an empirical study focussing on exploring the value and contribution of a design approach in a complex organisation. This is a case study of design as a management practice in the Australian Taxation Office. The study draws on Actor Network Theory and uses situational analysis (drawn on grounded theory methodology) to make visible the practices which are embedded in the organisation and to more deeply appreciate the social elements which co-exist in the situation to demonstrate participatory practices exist. This research sits at the intersection of design, business strategy and management studies and gives examples of what is happening in a real organisation. This study draws together interviews, observations of design teams in action, and organisational artefacts to build a case study exposing the nature of design and how it has been adapted and embedded in one organisation. This study situates itself in emergent literature about "design-led" organisations will be the way of the future (Martin 2005; Hippel 2007). That "design", "design thinking" and "design approach" is increasingly applicable and viable lens to view organisational management and managing change (Liedtka 1996; Liedtka 2000; Martin 2006; Martin 2006). The emergent discourse of "designing as managing" (Boland and Collopy 2004) presents arguments for the role design can play in the way business and management can approach and tackle the complexities and problems faced in business (Boland and Collopy 2004; Martin and Dunne 2006; Hippel 2007, Buchanan 1992, 1995). It emphasises greater attention to engage the public or customers in organisational decision making. This paper will emphasise the participatory approaches used in the case organisation in the design of new policy and changes to the tax administration system. This paper contributes to science and technology studies (STS) by providing empirical evidence of how design as a management approach enables public engagement. It also contributes to the applied methods of ANT and understanding the social situations at the boundary between the organisation and the customer. It contributes to an understanding that public engagement is possible and can offer organisations practical application of public engagement.

Scientific Uncertainty and Value Controversy: How to Make a Acceptable Environment Policy By Public Participation in China.

Shihong Yu, University of Tokyo; *Yuko Fujigaki, University of Tokyo*

In recent years, the public issues arose at the interface between science and society, such as environment issues, has been reshaping the decision-making mechanism of China. The traditional and closed decision-making mechanism which

dominated by the bureaucrat and experts has been challenged increasingly. As the reason for that, firstly, it related to the openness of the whole society and easy access toward information. Hence the public have opportunities to know and can make sound of themselves, even create pressure on the policy. Secondly, the more important one is the issues such as environment issues in public sphere are inseparable from science. And science itself has a great deal of uncertainties so that risk cannot be avoided. Furthermore, such issues are not only scientific issues, also different values of stakeholders have been shown here, even cause conflicts. Therefore, it's no doubt that the policy making is becoming more difficult and complicated. This paper explores the dilemma of decision-making and social controversy dues to scientific uncertainty and value controversy and considers how to make a acceptable environment policy by public participation in China through the analysis on the Yuan-ming-yuan Event arose in 2005. It stemmed from the question on the policy of environment governance by a citizen. As the remains of the ancient Chinese imperial gardens, Yuan-ming-yuan now has to confront the reality that Beijing is in shortage water and the problem of leakage in bottom of the lake in it. For the protection of ecology and the restoration of landscape, local government implemented the antiseepage project by laying polyethylene membrane on lakebed without Environmental Impact Assessment and people were uninformed. However, accidental exposure of the project quickly aroused great controversy, and finally the participation of the public make the government to re-examine the project and amend the policy. This event was considered as the symbol of scientific democratization and the real threshold of public participation in China, even the attempt on social democratization. This paper explores this event and the implication embedded in it by a detailed, qualitative multi-method case study. Firstly, I analyze the courses of this controversy and confirm three issues. That is, first, the issue of function location of Yuan-ming-yuan. In other words, it is a problem of value toward the park. Second, whether Yuan-ming-yuan is in shortage of water or not and which technological alternative is the best solution. In fact, it is a scientific problem. Third, the question on the legality of decision-making process. In this context, I consider scientific uncertainty and the limits of decision-making by expertise. I also discussion the value conflicts between experts and between experts and other stakeholders and the solution. It is very important to make the collaboration between scientific rationality and social rationality. Finally, by explores the public participation in the public hearing and Environmental Impact Assessment on the project of Yuan-ming-yuan, I move to the problem of public participation in China's environmental policy and also the approach of making a acceptable environment policy by it.

Boundary-Work at the Nexus of Science, Activism, and Policy Concerning Flame Retardants. *Alissa Cordner, Brown University*; *Phil Brown, Brown University*

This paper investigates the boundary-work done by scientists and non-scientists involved in work on flame retardants, chemicals which are widely used in consumer and household products and which have many potential negative health and environmental impacts. STS scholars recognize that science is as much socially constructed as it is empirically based, because science is done by people and takes place within a social context. In the context of regulatory and social movement activities, however, claims of scientific legitimacy are associated with social and professional authority and legitimacy. The boundaries around what counts as science and what does not can be observed through boundary-work, the active construction, maintenance and contestation over the legitimacy, authority, and resources associated with and hoarded by science. Flame retardant work is done at the negotiated boundary between science and non-science, as people from a range of scientific and non-scientific disciplines draw on science for different, often contradictory purposes. We argue that flame retardant research is often a boundary object that is produced and consumed in a variety of social spaces by many social actors. To investigate this contested boundary between science and non-science, we draw on over 25 interviews with scientists, activists, policy-makers, industry representatives, and toxics experts. Interviews were transcribed and then analyzed in NVivo 8.0, a coding software for qualitative analysis. Codes were developed based on the interview questionnaire and in an iterative fashion based on multiple readings of the transcripts. We make two claims regarding the relationships between science and non-science. First, respondents were actively engaged in professional activities and used rhetoric as scientists or non-scientists that crossed, blurred, or challenged the boundary separating science from non-science. Scientists collaborated with activists and spoke to congressional leaders, while activists engaged directly in research and drew on the scientific findings of others to make appeals to the public or to policy-makers. This is particularly evident as social movement organizations and actors used science in state bans on certain types of flame retardants. Second, even as respondents deconstructed that boundary with their professional actions and some of their rhetoric, they simultaneously reinforced and strengthened it in other ways. Scientists and non-scientists alike appealed to notions of scientific legitimacy and autonomy, and described activism and policy work as fundamentally and irreconcilably different from science. This paper makes three central contributions to the STS literature. First, we argue that these apparently contradictory patterns can be reconciled by recognizing that science is called upon by different actors who are pursuing different goals. Each type of claim furthers a certain argument and, the actors hope, helps them to achieve their goals in scientific and non-scientific arenas. Second, our analysis demonstrates that actors can pursue different goals at different times, and engage in boundary-work in multiple ways. Finally, we argue that the boundary between science and non-science is particularly important in areas, like flame retardant research, where questions of certainty, proof, and interpretation have huge consequences for scientific legitimacy, regulation, and public health.

033. Session of Technology, Environment and Health Risk Governance II

10:45 to 12:15 pm

13: 1322

At the end of the twentieth century, rapid development of society on a global scale caused vast changes and transformation. While industrialized society entered a new stage of evolution, globalization too brought with it a number of fresh challenges, on the one hand breakthroughs in newly emerging technologies, have brought with them global implications and developments. Yet no matter whether as a result of traditional technology or through the process of constructing new forms, globalization, with its rapid speed of development, has given rise to environmental pollution, transmittable diseases and food concerns, including global warming, disputes over CO2 or landfills, environmental hormones (persistent organic pollution, POPs) and HIV/AIDS.

A side effect of globalization, these newly emerging and closely observed interactions between technological, environmental and health risks which the aforementioned developments have given rise to, are fundamentally interdisciplinary in nature. Having been caused by both traditional and modern technology, they have overlapping and complicated environmental, technological, ethical, social risk perception and attributes of trust, as a result, this has already become an important governance issue and challenge for many countries around the world. It is in this context that this panel on 'Technology, Environment, Health and Risk Governance' implements this plan; hoping that by encouraging greater interaction and discussion, to get the ball rolling in terms of proposing related thesis, while experiencing a greater interflow of ideas and perspectives which will in turn deepen localized social risk governance research.

Participants:

Guinea pigs at Court - Two cases of industrial hazards in Taiwan. *Paul Jobin, CEFC Taipei office*; *Yu-Hwei Tseng, National Taiwan University, College of Public Health*

The former electronics plants of the Radio Corporation of America (RCA) have provoked a major occupational and environmental disaster in Taiwan. Over one thousand workers -

mostly female- are faced to different sort of cancers. The company has rejected demand for compensation, arguing that epidemiological research couldn't prove significant causal links. As they believe those cancers were provoked by job exposure and their drinking of polluted tap water, a group of 450 plaintiffs sued their former employer RCA and related groups (General Electric and Thomson) at the Taipei district Court with the support of the Taiwan Legal Aid Foundation (LAF). After a long procedural battle between 2004 and 2007, the medical controversy is now at the heart of the lawsuit to establish the liability of the companies. Indeed, various groups of public health researchers (mainly epidemiologists) have reached different conclusions, which so far, could only prove strict causal links for cancer breast. In Tainan, the LAF supports a group of residents of Anshun area, where an extremely high concentration of dioxin was found. After a first period of deny, contrary to RCA, the suspected company and public authorities admitted that the source of pollution was the former pentachlorophenol plant of China Petroleum Development. The neighbors have high level of diabetes which is being monitored by the city office' health department, but other matters of concern like cancers and reproductive disorders might be under-reported due to a cocktail of dioxin, pentachlorophenol and mercury. In 2005, the city office launched a compensation scheme. But unsatisfied with the level of compensation and worried by further health concerns, including an eventual raise of cancers, two hundreds residents have started in 2008 a lawsuit against the city, the state and the company. Those two cases highlight the limits of academic epidemiology and toxicology in their making of a hybrid object, between public health and monitoring of industrial hazards. In both cases, the plaintiffs have expressed their feeling of being used as guinea pigs for the purpose of Science, while they receive no or poor feedback in terms of medical and life care. They fear that after the politics of wait and see (more significant evidence) and juridical procedure, they must now witness more deaths due to never ending medical controversies at Court. Nevertheless, their lawyers try to run against the clock to transform insufficient data and inconclusive results into juridical decisions that will provide not only ex post recognition and compensation to the plaintiffs but also, ex ante, a clear signal for prevention policies of industrial hazards. Their argumentation goes through an interpretation of the barriers between animal experimentation and epidemiology (or categories like toxic for animals versus toxic for humans).

The Application of Precautionary Principle in Political Dispute － Regulating Melamine in EU, WHO, and Taiwan.
Kuei Tien Chou, Graduate Institute of National Development, Taiwan University; *Hwan Meei Liou, Graduate Institute of Technology Management, National Taiwan University of Science and Technology*

In the face of an increasing number of food safety incidents occurring internationally, the question of how to develop effective health policies with the capacity to regulate food-related risks has become an issue of growing concern for governments around the world. This paper will focus on occurrences of melamine-tainted milk powder, examining the implications of the differing policies regulating melamine limit and early warning systems implemented by China, the European Union (EU), World Health Organization (WHO), and Taiwan, in light of differences in their regulation cultures. In addition to discussing the EU's legislation on food regulations, this paper will also analyze the European Food Safety Authority's (EFSA) regulation structures, pointing out that the evidence-based risk assessment at the foundation of their food safety regulations, with its scientific-based standard decision-making process, has formed a weak precautionary principle within their governance model. In contrast to the EU, the WHO in handling disputes over melamine has channeled greater focus into aspects of public and social concerns through the precautionary principle, as well as proposing stricter regulatory limits. Finally, this paper analyzes how the Taiwan government's unilateral expert policymaking approach and lack of good risk communication in its governance of this dispute had given rise to intense dissatisfaction and growing criticism within the general public and in the end under strong sociopolitical pressure the government has been compelled to dramatically adopt the world's strictest preventative regulatory limits. The author hopes that this process of analysis will reveal the implications and governance issues raised by the use of precautionary principles in the context of different regulatory structures and systems.

Nanotechnalogy and Workplace Risk Governance: Institutional and Practical Comparison between Taiwan, Japan, and Korea.
YU-FENG Wong, National Cheng Kung University

Many countries have invested in nanotechnology research since 2000. Japan, Korea, and Taiwan invest in nanotechnology by focusing on international competitiveness. However, the nanoparticles emission from workplaces has evoked a huge debate about the relationship between nanomaterials and occupational health after it went in production line. Facing health risk from nanotechnology, stake holders have different views on it. Nevertheless, quite a few countries still created risk governance framework trying to reduce possible impacts on health. There are clear governance framework in Japan and Korea. By contrast, Taiwan has been only with experts' warning, nothing has been done. The three East-Asia countries all emphasized international competitiveness. Then, the patters of governance are quite different. It is our interesting to investigate the governance framework in terms of normative form and operational mechanism by reviewing literature and visiting the stake holders in the three countries. On the basis of knowledge of sociology, the following questions must be answered: what are the relationships between the stake holders, and how the relationships work and form the framework, what stand point and knowledge the stake holders have as to create the governance framework?

Chair:

Deng Seng Chen, Graduate Institute of Sociology, Taiwan University

Discussant:

Brian Wynne, University of Lancaster

034. Postphenomenological Research and STS II

10:45 to 12:15 pm
13: 1331

This is the follow-up session from Postphenomenological Research and STS I. This session will include five more presentations to be chaired and discussed by Don Ihde, Distinguished Professor, Stony Brook University USA. Again, each panelist will present an 'empirical turn' concrete study placed under a postphenomenological analyses.

Participants:

Postphenomenology and the spatial experience of telephone use.
Robert Rosenberger, Georgia Institute of Technology

The use of technology often shapes one's experience of space. The telephone is a revealing example in the everyday lifeworld in which a user's experience of spatiality is restructured. On the phone, the user's field of experience is trained upon the voice of the interlocutor thus focusing upon the auditory dimension. The work of postphenomenology has produced some preliminary work (Ihde, Verbeek, Rosenberger), but as developed so far, now needs expansion. Ihde's account of 'embodied' relations describes how a technology 'withdraws' and is thus a negative way of producing transparency. Critically supplementing this account, I want to articulate a postive description of shaping one's field of experience. Second, the traditional phenomenological account of 'sedimentation' needs to be retailored to describe the depth of bodily and perceptual habits which can hold in human-technology relations. I conclude with a discussion of the mechanisms of experience behind these characteristics of telephne use and offer comments upon the value of this account for contemporary debates in public policy.

Towards new goods: meeting human-computer interaction.
Daniel Fallman, Interacive Institute, Umea University,

Sweden

The proliferation of interactive digital technologies is becoming more important for everyday life with more and more experience with, through and by these appliances, mobile devices, web services and software applications. From the perspective of HCI (human-computer-interaction) digital transformations pose important questions which are often hard to grasp. Similarly, the increase of pervasive computational power whereby digital artifacts primarily intract with each other has blurred the concept of 'user.' Thus HCI has become more complex and forces us to deal with what are called "wicked problems" in design research. Traditional approaches have previously dealt with better defined and controlled problems, but wicked problems make for more difficulty for ethical and and philosophical concerns. This paper explores philosophy of technology in support of HCI to try to understand a "new good", seeking to find and establish a new guiding vision for the paraphernalia of approaches, technolgoies and frameworks in today's HCI. We need to take a step back and look at the direct effects these have on users and their tasks. This paper utilizes Borgmann's notion of the device paradigm and Ihde's human-technology relations as starting points towards such a guiding vision.

Building a Better Building. *Azucena Cruz, University of Paris IV (Sorbonne)*

Changes in the technologies which inform the design of buildings and their surrounding areas provoke chagnes in how we live, how we engage our lives spaces, and how we perceive ourselves as embodied beings. From a postphenomological perspective I will discuss postive and negative aspects of current technologies applied to the built environment. I shal specifically criticize the implementation of "pasive use" design and its consequences for social cohesion, individual enhancement and our subjection to the methods and rules of technology. I will look at two examples of new housing types as exemplars of the direction that architectural technology is currently taking. In each example, I will analyze the technologies implanted in the building, their uses, and how the user must adapt to the to produce changes in the daily lives of the users. This critique is not a rejection, but rather an occasion for debating how such technologies can be used and to what end. I take "advancement" as an aspect of technology, to seek how we can actually advance or enhance out living experiences rather than simply manipulating or depleting our interaction with lived spaces.

Phenomenology, Brain Science and Robotics. *Shoji Nagataki, International Liberal Studies, Chukyo University*

A central problem for cognitive science is how to explicate subjective experience. Mental contents can only be accessed introspectively, but are supposed to be unobservable from the outside. Yet, despite the fact that observable brain states and subjective mental states are intimately correlated, some argue that there is an explanatory gap between them. Even if we observe the state of the brain, we cannot fully share the ongoing experiences of the subject. Descriptions take place in radically different language, yet an intepretation of the data depends upon subjective and intersubjective reports. The problem is how to integrate first and second person reports into a scientific methodology incompatible with subjectivism. Both first and second person reports are also different from third-person data such as provided by fMRI. In this paper, I provide a schematic framework within which to incorporate first person descriptions by introspection and second person descriptions about bodily motion into a scientific study of mind. I argue that phenomenological methods, particularly those afforded by studies of the body, can be helpful in this task. I then show how this framework proves useful suggestions for those working in the field of robotics where robots are to implement some kind of agency or intention.

Chair:

Don Ihde, Stony Brook University

Discussant:

Don Ihde, Stony Brook University

035. Ideological and Practical Frames

10:45 to 12:15 pm

5: 511

Participants:

Constructing knowledge societies: Ideological frames and the history of molecular biology. *Simcha Jong, University College London*

How actors understand and interact with the natural world is shaped by the expert groups they belong to. This study will illuminate how these groups are formed. Analyzing the institutionalization of molecular biology across the distinctive cultural-political environments of scholarship at American, British, and German academic elite institutions, this study highlights how moral frames adjust the social lenses through which we view the world. Specifically, the findings identify three organizational mechanisms through which local ideological frames about knowledge, human advancement and the role of the state conditioned institution building in molecular biology. Finally, the relevance of the conceptual insights gained in this study are discussed for our understanding of the pre-eminence gained by American universities, organizational transformations in post-war science, and the development of modern thought. The idea that knowledge about the natural world is key to social advancement and progress runs as a thread through the history of modern thought. What it means to be 'learned' or 'knowledgeable' however has historically been a point of contention. Understanding the meaning actors attribute to 'knowledge' and 'learning', and how they link these concepts to their ideas about progress is critical to explaining the development of modern societies. This study will tease out in more detail how the technological advancements of the modern era and the way we organize expert knowledge are linked to ideological debates about learning and social progress among intellectual elites. American universities have redefined the professional landscape of contemporary societies over the course of the 20th century. Moreover, like their 19th century German counterparts American universities have developed into 'models' for what universities should be. Organizational blueprints associated with the American idea of university figure prominently in debates about university reform in Europe, Asia and the Middle East. To contextualize the ascendancy of the American idea of university during the second half of the 20th century, this study will contrast ideological frames guiding academic scholarship at American elite universities with frames guiding academic scholarship at elite institutions elsewhere. Moreover, it will analyze the impact of these frames on the emergence and organization of new disciplines of academic thought. Although existing studies offer rich insights into the interplay between local social orders and processes through which 'facts' are established within expert groups, the institutional dynamics that support these orders deserve further attention. To illustrate how moral orders underpinning political economies impact the technological, social development of these economies this study will focus on the early history of molecular biology at academic elite institutions in Germany, the United Kingdom and the United States. Molecular biology was among the most important new scientific fields to emerge during the post-war era and its rise coincided with the ascent of American science. In addition, the history of molecular biology is not only an interesting case study because of the field's academic significance, the field also had a transformative impact beyond academia on the way contemporary societies conceptualize and deal with health-related issues in general and on medical practice in particular.

The Unsuccessful Patient: Determining Blame and Technological Efficacy in Weight Loss Surgery. *Lisa Joy Borello, Georgia Institute of Technology*

In recent decades, obesity has become constructed as global public health crisis and labeled a 'disease' of epidemic proportions. Though obesity is still largely considered a

behavioral problem that can be managed through diet and exercise, surgical intervention is becoming a more normalized approach to 'treat' obesity. As such, a host of technoscientific solutions - specifically non-cosmetic weight loss surgeries (WLS) - have emerged in an effort to medically manage not only the bodies of the morbidly obese, but also those considered simply 'overweight' or 'at-risk' for developing obesity. Despite the life-threatening risks and medical complications associated with bariatric surgery - a term used to describe a type of weight loss surgery that restricts an individual's ability to eat, either through an external device such as a LAP-BAND, or by re-routing or 'stapling' the stomach - popularity of the surgery continues to grow, particularly as more insurance companies are willing to cover the cost of the procedure. While medical professionals tout improved surgical techniques and new quantitative risk-calculating tools to guarantee successful surgical outcomes, patient and surgical failure is still possible - in this context, 'failure' can range from patient death and serious medical complications, like malnutrition or clotting, to inability to meet intended weight loss goals. This study explores both success and failure from the perspective of various actors - medical professional associations, surgeons, patients, federal/global health organizations, biomedical firms specializing in obesity intervention/treatment, insurance companies, and the media - in an effort to reveal the complex constructions behind technological remedies for obesity. Relying primary on an analysis of news and press releases from professional medical societies (American Society for Metabolic and Bariatric Surgery), companies developing and marketing surgical obesity treatments (such as Allergan, the makers of the LAP-BAND adjustable stomach-banding device), and government-sponsored health organizations (National Institutes of Health, Centers for Disease Control), as well as patients and patient support groups, and popular media, this study aims to examine the ways in which surgical risk and responsibility are constructed by various social actors within the United States. This paper argues that most actors tend to over-emphasize the technological efficacy of WLS; as such, they are also more likely to blame the patient, rather than the technology, for 'failing.' Though this project is theoretically grounded in actor-network theory, it also draws on medical sociology, arena analysis and technofeminism to explore a largely understudied topic within STS. Further, this study more closely examines the role of social difference in regards to obesity and weight loss surgery; because there exists a large disparity among those considered clinically obese - usually poor minority groups - compared to those who actually have the surgery - white, middle-class women - issues of gender, race and class are central to this study. In applying a critical feminist eye within a context of both a seemingly gender-neutral 'disease' and gender-neutral technological remedy, this study aims to contribute to both STS and gender studies.

Frame analysis of stakeholders in scientific controversies: The issue of fish intake within United States' scientific literature. *Nobuko Ueno, University of Tokyo*; *Yuko Fujigaki, University of Tokyo*

This study examines the scientific controversy surrounding food safety regulation in the United States, specifically the dispute regarding health risks caused by carcinogenic chemicals, and the health benefits of Omega-3 fatty acids associated with fish intake, as presented in scientific literature. Using web searches, scientific literature and social commentary were selected, and then organized into three separate categories: (I) peer-reviewed articles, (II) research reports based on original scientific data, and (III) evaluation and commentary of these two-types of scientific literature. Research was carried out by first analyzing the underlying process behind scientific controversies, and then examining the evidence using frame analysis of the actors involved. Results indicate: (1) in the case studies analyzed, scientific controversies proceed unresolved over a period of several years; (2) due to different modes of inquiry employed, there are often conflicting views among actors regarding the same issue; (3) the differences between these modes of inquiry are the result of differences in value and belief systems; (4) accordingly, frame analysis of scientific literature proves that conflicting evidence which sustains these scientific controversies is due to actors' modes of inquiry. The contribution to the STS literature of this study is as below. One is novelty of methodology by using frame analysis of contents of scientific literature, and the other is clarification of the underlying process and evidence of the scientific controversies.

Social affinity to vaccination: everyday life perspectives. *Tzung-wen Chen, Department of Sociology, National Cheng-chi University, Taipei, Taiwan*

Inspired by prior research about vaccine acceptance (Streefland et al., 1999) and recent controversies about H1N1 vaccination, this paper discusses the concept of social affinity to vaccination in a society, from everyday life perspectives. Based on different social mechanisms, the social affinity is categorized into two ideal types: type I social affinity is a kind of collective construction by state's power and individual's rational use of vaccine; and type II social affinity is from interactions between expert groups and individuals around risk perception. The vaccination culture of a society thus includes at least the two affinity types and other related determinants. The first everyday life perspective is Henri Lefebvre's critique on the domination of technocracy in the modern society (Lefebvre, 1991 [1947]). Lefebvre opens a door for us to examine routines in our modern life. For example, an individual's body right is often ignored under the experts' discourse that is incarnated in the immunization programs. This gives birth to type II affinity. The second perspective is the everyday practices of Michel de Certeau (1998 [1980]). Different from Lefebvre's concern in the collective level, de Certeau emphasizes on everyone's strategies or tactics in face of social and technological constraints. The autonomous choice of everyone is therefore the source of type I affinity. Reviewing the history of vaccination in Taiwan, the paper argues that the universal vaccination of hepatitis B vaccine (HBV) in the 1980s marks a milestone for type I affinity. In fact, the vaccination has become a universal symbol against all kinds of diseases or even preventable incidents, as vaccines are called as "preventive needles." It is for this reason that the type I social affinity dominated the vaccination culture since then. The recent development of H1N1 vaccination is a signal of shifting the vaccination culture from type I to type II affinity. No more "preventive needle" was used to call the H1N1 vaccine. Without a symbolic name, the H1N1 vaccine was well perceived by the public for its risk, and the type II affinity became more significant. It is similar to the case of HBV in France in the early 1990s, as more adverse events were aware in this country where the vaccination is a tradition (Moulin, 2006). Comparing the HBV cases in Taiwan and in France, as well as the recent H1N1 case, the paper suggests that the vaccination culture changes along with the evolution of vaccine technology, immunization institutions and other factors, such as social communication. The paper challenges conventional approaches to explain how vaccination interacts with a society such as the risk acceptance perspective (ex., Douglas, 1985). We argue that a vaccine is not just an artifact. In some cases, it is a symbolic object. The paper's major contribution is to propose various social mechanisms to explain the vaccination culture, which could then be different from one society to another. It helps us to know more about the vaccine and its interaction with the society.

"We've Got to Make Bird Flu Sexy": Selling Biosecurity in Vietnam. *Natalie Hannah Porter, University of Wisconsin Madison*

Despite six years of concerted global health efforts in Vietnam, Highly Pathogenic Avian Influenza (HPAI) shows few signs of abating. Indeed, increased poultry trade for the Lunar New Year holiday effected several new outbreaks across the country. As Vietnam's bird flu strategists shift emphasis from emergency responses to long-term pandemic preparedness, state policy-makers and global health practitioners are mobilizing health interventions around new concepts. Against this background,

biosecurity is emerging as a central organizing principle for avian influenza management. Evoking the rationality of natural sciences, and images of defensive safety, biosecurity is an attractive concept to a variety of state and non-state actors. Employing ethnographic research on two bird flu "behavior change" campaigns, this paper traces how bird flu specialists (life scientists, state agents, humanitarians, and nongovernmental workers) articulate biosecurity according to existing political ideologies and institutional practices. I show how these actors mobilize biosecurity concepts according to the competing logics of social marketing doctrines, farmer-first participatory approaches, and socialist state planning models. I argue that biosecurity debates center on whether farmers' knowledge and risk perceptions should influence pandemic strategies. While both behavior change campaigns set out to empower farmers to define and practice biosecurity according to their personal capabilities and local contexts, they ultimately identified a particular set of biosecurity behaviors to "sell" to farmers. I suggest that this shift corresponded with broader global health agendas to "mainstream pandemic management," wherein donor and intergovernmental organizations delegitimize culturally-specific knowledge and practices in favor of standardized, universally marketable biosecurity models. Scholars of science and technology continually encourage ethnographers to investigate the social construction of scientific objects, and the multiple realities that constitute them (Latour 1987, Law and Mol 2002). Recent work in social science and anthropology critiques the social assemblages and practical engagements surrounding biological threats (Ong and Collier 2005, Rose 2007, Janes and Corbett 2009). Focusing on the proliferation of "biosecurity" in both policy-making arenas and in popular consciousness, innovative scholarship shows that loosely connected social actors articulate and operationalize health risks in everyday negotiations (Lakoff and Collier 2008, Collier et. al. 2004). Pointing to biosecurity as an emergent object, these critics argue that it "is useful and necessary to locate and intervene at sites where the ordering of biomatters is open to doubt and or contestation" (Bingham and Hinchliffe 2008). My research responds to this challenge through an ethnographic investigation of the ongoing debates and practices constructing avian flu biosecurity. In Vietnam's dynamic sociopolitical context, this research reveals how existing forms of knowledge intersect and collide with burgeoning global health agendas to create biosecurity standards. Under the auspices of "One World One Health," these standards herald crucial consequences for biological threats and pandemic confrontations.

036. Science at the bar

10:45 to 12:15 pm

5: 512

In this session, bar, especially civil court will be focused as a public sphere where science & technology meets society. While science in public policy and regulatory science in regulatory agency have caught large attention among STS communities, science at the bar and forensic science in judicial authorities seem to take less attention so far especially within Japanese STS communities. However, once we look on recent cases in Japanese civil court, it is no doubt that many of scientific controversies regarding technology assessment on new technology such as health effects of electromagnetic fields as well as environmental effects of field experiment of GM (genetically modified) crops have been taking place one after another. Standing on these recognitions, the session aims two things. One is to analyze why 'science at the bar' should be focused in Japan. The first and second speakers try to answer this question from the point of attorney of lawyer's view and scientific expert's view respectively. The third speaker follows to develop in-depth case study on the GM-rice trial (2005-2010) in Japan. Their arguments will suggest some feature of practical and historical problems in Japan with respect to the style of scientific expert's witness, science communication in the court, and the role of court in a context of risk governance within society. Another purpose of the session is to explore some insights on the issue of science at the bar from a more global context. The final speaker, chief justice at common law supreme court of New South Wales introduce unique experience in Australia in terms of the style of scientific expert's witness in the court. Australian experience which improved the problems of traditional adversary system will provide useful suggestions regarding science at the bar both from practical and theoretical interests. In order to develop the arguments in the session, we invite Sheila Jasanoff, an author of the pioneering book 'Science at the Bar' (Harvard University, 1999) as our discussant. Through the discussion within the session, it is expected to highlight the meanings and angle to focus on the less studied area of science at the bar.

Participants:

Why we should focus on science at the bar:from the point of lawyer's view. *Tamiko NAKAMURA, Lybra Law office*

New technology has now become widespread among society without enough assessment of its potential risk. Therefore, many people are anxious, and sometimes, people want to bring a case before court in order to determine whether society should admit such a new technology or not. At the same time, lawyers are confused at such scientific dispute. We lawyers tend to think risks are known clear by "enough" scientific assessment. Lawyers believe there must be incontrovertible scientific evidence, and if lawyers can submit it, they are sure to win the case. If lawyer find contradictory or controversial scientific evidences against their opinion, they tend to think those are "wrong". Lawyers try to find only supporting scientific evidence for them and, at the same time, they hide any contradicting evidences. The Japanese Supreme Court seems to think that right scientific evidence must lead to a single conclusion. But many scientists are shocked when they know such a thought of lawyers. According to such thought, the scientific evidences with some doubts are not credible. At the Bar, if the expert witness testifies to uncertainty, it triggers very strong cross-examination. The lawyer looks for some claims on which scientific experts themselves admit any uncertainty or doubts for the purpose of reducing credibility in the eyes of judge. The lawyer will indicate the expert's testimony has an important deficiency and therefore he is not a credible witness. In the adversary system in the Japanese civil procedure, in general, the witness is prohibited from testifying freely. In this way, lawyers, judges and people struggle to find "certainty" in the heap of what is called "scientific" evidence, in spite of the fact that all scientific evidence has an element of uncertainty. As a result, lawyers are often guilty of distorting the scientific evidence in court in order to win the suit. In a Court, expert witnesses who testify with ambiguity are not considered credible. This often discourages scientists from giving testimony, and causes mistrust between scientists and lawyers. From the standpoint of scientists, if they say that they know about what they do not know, it breaks the code of conduct which the Science Council of Japan requires. And where scientific uncertainty exists, they don't always provide a single answer. Their answer will depend on various conditions because, as of now, science is always moving forward. The society of scientists and the society of lawyers seem to be too far apart. Their educational backgrounds, working environment and values system are so different each other. The problem is not only that society of scientists doesn't communicate "how science works", but also the society of lawyers doesn't communicate "how justice works". This lack of communication obstructs the collaboration between scientists and lawyers. Science seeks truth. Law seeks justice. The purpose of two parties differs from each other, but both of two can collaborate to reach good legal conclusion with healthy scientific knowledge.

Why we should focus on science at the bar:from the point of scientific expert's view. *Tuyoshi Hondou, Tohoku University*

Bar is one of the most typical place where science severely meets society. Scientific evidence is used for a court decision. Simultaneously, the court decision may have a social influence on the scientific activity through, for example, evaluation of confidence of the scientific evidence by the judgment. Scientific evidence is used in courts of law as a basis of judgment because of its independence of the parties in conflict. At the 4S meeting we will show the inevitable, fundamental conflict between the

fair treatment of scientific evidence and the adversarial system by citing a case study on the protocol of cross-examination (2008) in which the author was an expert witness in a court case concerning the effects of electromagnetic fields on health. After the examination in chief, the defendant's attorney attempted to fabricate a scientific fact by asking T.H. a leading question. Although making such an attempt is regarded as misconduct in science, it has been regarded as a "Golden Rule" of advocacy (Keith Evans, "The Golden Rules of Advocacy", Oxford University Press, 1993) and is a commonly employed strategy (see, for example, Feder's Succeeding as an Expert Witness). Although asking leading questions in testimony is not controlled, at least in Japan, it is undeniable that it leads to the fabrication of scientific evidence. We demonstrated this by applying the Golden Rule of advocacy to the theory of thermodynamics. Since fabrication of scientific evidence fails should the judge detect the fraud, the problem may be attributed to a lack of scientific literacy among judges. This is critical when applying precautionary principles in a court of law because lawyers from both sides have only "fragile" evidence and the expert's testimony can only be hypothetical in such cases. Repeated failures of Japanese government to enact precautionary measures (Nature 413, 333, 2001) may have the similar scheme as in a court of law, where the judges are replaced by the government. We wish to hold discussions with the 4S participants on how to construct a legal system to deal with scientific evidence fairly and effectively.

Scientific controversies in the court: GM-rice trail in Japan (2005-2010). *Takako Nakajima, International Christian University*

GM (genetically modified)- rice is now pending on civil court in Japan, attracting many of national and international interests. This presentation analyses the GM-trial in Japan (2005-2010), by highlighting its historical backgrounds, the style of scientific controversies in the court and the role of court in risk governance. GM-rice in question was developed by the MAFF(Ministry of Agriculture, Fisheries and Forestry) as a part of the national project, and its field experiment was authorized by the MAFF and the Ministry of Environment on 2005. It means both the significance and safeties of the GM-rice are admitted officially through official due-courses. However, the issue is brought into court leading to highly complex scientific controversies regarding potential risk of the GM-rice. As to the backgrounds of the trial, it may say that grass-rout consumer movements emerged in the early 1970's have brought the GM-rice issue into the court in the 2000's. In the history of consumer movements in Japan, two of major chemical poisonings, namely the Morinaga (arsenic poisoning by powdery milk discovered on 1955 with more than 130 babies' death) and the Kanemi (PCB and dioxin poisoning by cooking oil disclosed on 1968 with more than 14,000 people's reports) are unforgettable as its starting point. In addition, it is well known that the role of court in these historical poisonings was decisive but insufficient, because limited accident investigation done by the court had influenced badly to the practice of relief for victims. Therefore it suggests that consumer movements stemmed from visible accident by the newest technology at the time react sensitively to unseen risk by the newest technology today. As to the agenda of dispute, possibility of appearances of resistant bacteria is heart of the controversies, because antibacterial protein defensin gene is introduced to the GM rice in order to be resistant to plural disease among Japanese rice. It should be stressed here that the resistant bacteria issue was not an agenda within the official procedure of approving the field experiment of GM-rice. It means the trial itself made the omitted topic regarding the potential risk visible. As to the feature of dispute based on adversary system, it can be pointed out that the defendant is keen either to guide the controversy to a trivial matter by using scientific jargon or to disturb the third party's experiments by providing the useless sample, while the plaintiff tries to explain the most advanced scientific evidences in a daily wording by conducting the extensive learning by themselves. Therefore it is not easy for judge to convince where is the truth about the potential risk and to which extent it would be important to consider. Concerning the fact that ignored agenda became the hottest controversies in the court regarding the potential risk of the GM-rice, the trial is substituting the function of public risk assessment, suggesting the limit of adversary system concretely and the deficit of risk governance in society.

Austlaian Expericne of Concurrent Evidence. *Peter McClellan, Supreme Court of New South Wales*

In this presentation the historical background and the basic procedure of concurrent evidence which has been recently introduced into Australian courts will be discussed. Concurrent evidence is a new and more effective method of dealing with scientific evidence. Traditionally, in cases which involve some scientific controversy, expert evidence was introduced into court by the separate examination of each witness. Under the traditional method used by the adversary system, the scientific experts gave evidence by being examined and cross-examined by advocates. The experts cannot ask each other questions. In the adversarial method it could be difficult for the judge to know where the scientific truth lay. The advocates aim is to win the case and he or she may have no interest in the truth. By providing for the separate examination of each scientific expert the court process was often lengthy and costly. It was commonly the case that expert witnesses were attacked by hostile questions in court. As a consequence many well qualified expert witnesses refused to become involved in court cases. To address these problems Australian courts have developed a new system for dealing with expert witnesses called concurrent expert evidence. It was first introduced in New South Wales, Australia in the Land and Environment Court in 2005. Under this new system each expert is required to prepare their own report. They must then meet, either by telephone or face to face and discuss the issues and prepare a joint report which identifies the points where they agree and disagree in relation to the controversial scientific issues. They then give evidence together in the court room which is known as concurrent evidence (some times called "hot tubbing"). During the concurrent evidence the judge chairs the discussion using as the agenda the document prepared in the joint conference. Under concurrent evidence the judge plays a more active role in questioning the experts in contrast with the traditional adversary system where the judge generally leaves all questioning to the advocates. Experience has shown that concurrent evidence often shortens, at times significantly, the length of time taken for expert evidence. Evidence which may have taken a number of days can be completed in only one day. Concurrent evidence gives the judge a better understanding of the scientific controversy. It allows the experts to question each other, clearly revealing where they differ and the reason for their differences. Because it allows the scientists to give their evidence without the hostility of the traditional adversarial process the experts are greatly in support of concurrent evidence. With the introduction of concurrent conference because of the change of procedure and philosophy in receiving scientific evidence in court there was strong opposition from some judges and many lawyers. However, as the merit of concurrent evidence has become known the more it is has been accepted. In order to ensure that concurrent evidence is used more widely and effectively the education of judge and lawyers about the method is desirable.

Chair:

Hideaki Shiroyama, University of Tokyo

Discussant:

Sheila Jasanoff, Harvard University

037. Theorizing Nuclear in Asia: Nuclear "Renaissance" ? / II

10:45 to 12:15 pm

5: 513

This panels builds upon the initial themes explored in "Theorizing Nuclear in Asia: Nuclear "Renaissance" ? / I, by taking the image of the atom in

Japan and moving from the historical circumstances in 1945, to geopolitics, to the contemporary dimensions of nuclear power in Japan. Together, the two sessions attempt to re-situate the atom within a larger "Asia"--considering primarily the NE / SE (and South Asia) cases.

Participants:

Nuclear Imagery and Cultural Meanings of the Atomic Bomb in the Occupied Japan. *Kenji Ito, The Graduate University for Advanced Studies*

This paper explores cultural meanings of the atomic bomb in immediately postwar Japan by examining popular culture and public discourse. The paper demonstrates, despite later strongly anti-nuclear sentiment in Japan, popular culture, articles in popular magazines, discourse of Japanese intellectuals saw the atomic bomb favorably, displaying more admiration than abhorrence to the power of the bomb. The main focus of the analysis in this paper is science fiction comics by Yokoi Fukujiro and Tezuka Osamu as well as a juvenile novel by Suzuki Satoshi. The paper also explores various cultural products that appeared during the occupation period, such as school newspapers, labor union bulletins, and advertisements, as well as publications by physicists such as Taketani Mituo and Nishina Yoshio Then the paper discusses how this happened. In addition to relative constraints on circulation of information under the censorship during the US occupation, many Japanese, including scientists and left-wing intellectuals, endorsed a very strong optimism about science and technology. Thus they saw the atomic bomb as rightful power of scientific and political advancement and nuclear power as a basis of their hope for future prosperity.

Nuclear Doomsday and the Origins of the Whole Earth. *Robert Jacobs, Hiroshima City University*

Dr. Robert Jacobs, Associate Professor, Hiroshima City University Nuclear Doomsday and the Origins of the Whole Earth This paper explores the content and origins of the image of the whole earth as seen from space. It demonstrates how the conceptual and visual content of the photographic image of the whole earth emerged in response to the atomic bombings of Hiroshima and Nagasaki in 1945. This content includes the idea that while nuclear war might be fought by distinct nations, its effects would be global, thus rendering political boundaries irrelevant; that all of the people of the world share a common destiny, either survival or destruction; that the earth itself is a fragile home to humans and other life forms. I will use editorial cartoons published in the United States in the immediate aftermath of the bombings of Hiroshima and Nagasaki to demonstrate the emergence of this iconography. This paper will also detail the history of the later emergence of photographs of the earth from space and explore their history in the sixties counterculture and later environmental movement in America.

Case study about the nuclear safety governance and role of local government in Japan. *Shin-etsu Suguwara, University of Tokyo*

Mr. Shin-etsu Sugawara, Doctoral student, University of Tokyo "Beyond the Stereotypical Criticism by Nuclear Experts: STS Case Study on the Role of Local Governments in Japanese Nuclear Utilization" There are few social-scientific studies about "after the siting" of NIMBY facilities compared to those of siting process. However, it is equally-important matter how to build a constructive relationship between such facilities and siting areas from a long-term standpoint. In particular, we believe that STS should make intellectual contributions to the problems of "after the siting" of the facilities associated with S&T of great uncertainty and complexity. This paper takes Japanese local governments (prefectural and municipal governments) where nuclear facilities located for example. In Japan, the national government regulates exclusively the safety of nuclear facilities based on the legal regulations. However, local governments, which has two-tiered local autonomies "prefectures" and "cities", also involve in the nuclear safety governance to protect the residents' safety and welfare based on the "safety agreements". These agreements are concluded among local governments and utility companies. They include the articles which can be recognized as local governments' authority de facto such as local governments' prior consents when the utilities make an important change to their facilities, as well as the ones which provide utilities' duties such as immediate notification procedures in case of accidents and incidents. By utilizing the safety agreements, local governments have obtained a wide range of information from the national regulatory agency, and they've got the opportunity to express their opinions toward the utilities. However, even as for technical issues about the safety of nuclear facilities, local governments often make use of these agreements in view of regional promotions, enhancement of municipalism and Governors' politic appeal, etc. It's natural course of action for local governments because they hosted the inconvenient facilities for their regional developments. However, this situation has been criticized by some nuclear promoters and engineers who argue it becomes an obstacle of stable operation of facilities and national energy security. In fact, substantially, Governors and local governments sometimes strongly control the operation of the facilities utilizing safety agreements which don't have legally binding (for example, restart of NPPs operation after incidents or accidents). Through the semi-structured interviews with many stakeholders, this paper will illustrate the actual conditions of local governments' engagement in nuclear safety governance and discuss about the constructive but critical implications in terms of STS standpoint.

Chair:

Togo Joseph Tsukuhara, Kobe University

Discussants:

Sang-Hyun Kim, Hanyang University
Togo Joseph Tsukuhara, Kobe University

038. Adapting Engineering Knowledge to Changing Contexts

10:45 to 12:15 pm
5: 514

In ways that can be quite productively contrasted against science, engineering is a domain of knowledge that undergoes radical reconstruction in response to major changes in social and historical contexts. Indeed, engineering educators, through their public statements as well as actions, have both professed and demonstrated a cultivated obligation to engage in the routine reexamination of the very epistemological foundations of their discipline. As a consequence, diverse and often competing ideas about the basis and scope of engineering expertise has emerged, ranging a commitment to embodied knowledge, to mathematical abstractions, to engineering science and specialization, to both instrumental and non-instrumental understandings of the humanities (and in different combinations). The papers within this session enable cross-national comparisons of this phenomenon, spanning different periods of history as well as the historical development of the engineering profession. Diogo's paper examines the embodied circulation of knowledge between the European center and periphery, and the attendant increase in emphasis on formal mathematical analysis in 18th century Portuguese engineering. Cast within a broader timeframe, Downey and Wada's historical ethnographic study examines changing Japanese ideas about the underlying social motivations, or normativities, for engineering knowledge and professional identity from the pre-modern Edo period, through the Meiji Restoration, until the present. Akera's study in turn focuses on the U.S. Cold War shift towards engineering science and increased specialization, as demonstrated through a substantial change in the structure of engineering education accomplished by the 1960 Master Plan for Higher Education in California. Gezelowitz' paper addresses present day engineering education reform efforts in the United States, and especially the ABET EC 2000 criteria requiring accredited programs to explicitly help students "understand the impact of engineering solutions in a global, economic, environmental, and societal context"; it is built around a review of the uses of the history, and especially the use of history of technology and engineering, in accomplishing this purpose. But as presented by the Director the IEEE History Center, Gezelowitz's talk will also provide the audience with a useful segue into a broader discussion about the uses of history and historical ethnography in present day engineering education reforms. Andrew Jamison and Ulrik Jørgensen, recipients of a recent grant to study engineering in the Danish national context, will serve as the discussant and

chair, and thus add an additional European perspective to the panel. [Because of our desire to have the indicated discussion period with the audience at the end of this session we request, if possible, that a fifth paper not be added to this session.]

Participants:

Circulating Knowledge, Training Engineers in the European Periphery: Manuel de Azevedo Fortes and His Textbook "O Engenheiro Português." *Maria Paula Diogo, FCT, Universidade Nova de Lisboa*

The creation of a well-defined professional consciousness relies largely on its corpus of knowledge. The "initiated" receive a unique training, which allows them to deal with the theoretical and practical questions of a specific professional field. Therefore textbooks and schools play a decisive role in shaping the profile of each profession. From the 16th to the beginning of the 19th century Portugal was a rich country, where gold and silver, pepper and silk, allowed the ruling classes to linger on an easy, non-productive existence. It was easier to import than to produce: machines, goods, scholars, teachers were paid to come to Portugal. The process of creation and sedimentation of a local intelligentsia was thus delayed, as there wasn't any true local appropriation of knowledge. There were, however, some exceptions. Manuel de Azevedo Fortes was one of them. Himself an "estrangeirado" (European oriented intellectuals), Azevedo Fortes tried to build a strong national community of engineers, using both his personal network of contacts and his personal experience in several European countries and shaping it to the Portuguese reality. His book /O Engenheiro Português/ (The Portuguese Engineer), published in 1728-29, became the main engineering textbook for those who studied at the Military Academy and the keystone for building a local expertise on this area. In this paper I will analyse the role of Manuel de Azevedo Fortes as one of the "builders" of the Portuguese engineering community, by focusing on his written work and mainly on the /O Engenheiro Português./

The First Normativity: Engineering Formation and Japan. *Gary Downey, Virginia Tech*; *Masanori Wada, Tokyo Institute of Technology*

What is engineering for? What are engineers for? A core issue in engineering studies is the normativity of engineering knowledge and engineering practitioners. Engineering is not derivative of science but draws upon it as resources in the pursuit of broader projects. Sorting out its multiple, changing normativities is key to mapping what is, has been, and could be in engineering. The first normativity in engineering has been contributing to the material progress of countries. The equivalence engineers see between technical work in engineering and human progress as a whole is multiplied in the first instance by the contrasting images of progress across different territories. One can see the priority of progress in dominance practices of engineering formation. This presentation summarizes a chapter-length ethnography of emergent dominance in the formation of engineers across Japan. The account consists of five ethnographic episodes marking key changes in the dominant practices of engineering formation, beginning prior to the Meiji Restoration and continuing to the tensions of the present. Focusing on the designers of engineers, each episode calls attention to how acceptance of new formation practices enabled them to achieve congruence in their identities as both engineering educators and members of the country. The five episodes include: (a) before progress: Rogaku/Kogaku learning during Tokugawa; (b) import and replacement at the Imperial College of Engineering; (c) service to the household through the private university; (d) reformation after the War and dramatic expansion; and (e) the tensions of internationalization. After briefly introducing the project and providing an overview of the five episodes, the presentation offers a more sustained analysis of one episode.

Regional Interests, Engineering 'Manpower' Crisis, and the Cold War Transformation of California Higher Education. *Atsushi Akera, Rensselaer Polytechnic Institute*

The Cold War era in the United States created a dual pressure for increased specialization and a more science-based approach to engineering. However, because the engineering professional configuration in the United States compelled its engineering schools to remain wedded to an already compacted four year undergraduate model, the smooth, evolutionary transition of curricula remained impossible. As drawn from a larger book project, this paper focuses on the Cold War transformation of engineering education in California, and the specific impact that regional interests and the particular severity of California's "engineering manpower crisis" had not only on engineering education but the entire structure of higher education in California. California's public system of higher education was already based on a tripartite division that created a separate estate for junior colleges, state colleges, and the University of California system. However, postwar economic developments threatened an established balance. Existing accounts make it clear that postwar demographic trends, along with California's historic commitment to "democratizing" higher education, contributed most directly to the 1960 Master Plan for Higher Education in California. Nevertheless, it was no accident that the most vocal advocates for reform, President Malcolm Love from San Diego State and John Wahlquist from San Jose State, were from the two regions most affected by postwar economic changes, namely those resulting from Southern California's booming defense industries, and the new electronics industries surrounding Stanford. Nor was it an accident that the decision to greatly expand California's system of junior colleges—and thus ensuring access while controlling costs—mapped onto a national dialogue calling for a vast expansion in two-year technical-institute type training. Innovative programs in continuing education, especially at UCLA and San Jose State, also emerged in response to the new demand for postgraduate training and graduate education in California's new high tech industries. A close study of the negotiations leading up to the 1960 Master Plan reveals the precise extent to which regional interest and engineering workforce issued shaped the politicized dialogue surrounding California's system of higher education, and how the state's engineering education programs were transformed, in turn, by this political dialogue. The resulting changes contributed not only to the much envied success of the UC system as a powerful network of research universities, but to the robust development of a technical workforce facilitated by a newly rearticulated tripartite system. The paper closes by documenting how the conversations and developments in California also influenced the national dialogue surrounding Cold War engineering education reform.

Using History of Technology to Promote an Understanding Among Practitioners of the Impact of Engineering Solutions. *Michael Geselowitz, IEEE History Center*; *John Vardalas, IEEE*

Ten years ago, ABET, the primary accreditation organization for post-secondary engineering and technology departments in the United States, revised their requirement for undergraduate programs leading to a bachelor's of science degree in engineering. The new standards, known as EC2000, require that students receiving the B.S. degree "understand the impact of engineering solutions in a global, economic, environmental, and societal context." The logic behind such a requirement is obvious, and other national bodies have similar standards. Given the increasing globalization of technology even in just the past decade, many ABET-accredited programs have emphasized STS-style courses or course modules emphasizing current international finance and current transnational issues such as global climate change. However, the issue of the impact of engineering decisions within and between societies is not a new one. By ignoring the deep historical context of engineering, such curricula miss an opportunity to have students explore a more fundamental understanding of the interplay between technology and the other aspects of the society. Historians of technology can bring to the table a breadth and depth of case study analyses that broaden the perspective on this issue. This

paper presents preliminary attempts to develop engineering course modules that use the history of technology, including the history of engineering, to make future engineering practitioners more aware of the impact of their technical decisions on society at large.

Chair:
Ulrik Jørgensen, DTU Management

Discussant:
Andrew Jamison, Aalborg University

039. Innovation and Power Politics

10:45 to 12:15 pm
5: 515

Participants:

The Conflict among Experts and Government in a Replication of an Ancient Junk. *Jeng-Horng Chen, National Cheng Kung University*

In an engineering case, how do engineering experts from the same field and different fields interact when encountering conflicts? Why experts from different fields have incompatible opinions even though they have the same goal? Why experts from the same field have different priority in options, even their technical evaluations of various options are the same? In this article, recorded observation and literature analysis methods are used to compare opinions about the goal, design principle, and methods of construction of the replication of an ancient junk from naval architects, historians, engineering professors, and government officers, especially based on experimental archaeology, culture heritage, and touristic productive enterprise point of views. Using actor network analysis, it is found that technical content is not decisive on how an engineering case's options are evaluated and chosen, and how the work is planned and executed. Instead, technical content and cultural values merely lay a playground and limit, the final decision was determined by power, interest, and politics.

The User in Housing Innovation: An Endless Forgotten Actor? *Tricoire Aurelie, CSTB - Paris Est*

This proposition is an exploratory research based on 3 main fieldworks. The first one concerned 5 French public schools and their energetic consumption. I studied how the users of this specific public good handle or not energy saving devices. The second bunch of observations (still in progress) deals with the acceptance of an alarm device dedicated to ageing and/or disabled population in order to maintain them at home. As the alarm set is made of multiple captors disseminated in the equipped house, it induces some disturbance (like little house furniture reorganisation and/or some installation work). Here the issue is the acceptance and the acceptability of such a disturbing device in your home, and mostly for people strongly dependant to their material marks. The third explored fieldwork (also in progress) concerns the use of consumption energy information device in a social housing building. The data collected (semi-directive interviews, observations and questionnaires) all focused on the key question of the use of technological devices in housing. As the research on the NTIC use demonstrated (Mackay et al. 2000; Woolgar 1991; Silverstone & Hirsch 1992; Jouet 2000; Flichy 2008; Pharabod 2004; Akrich 1992; Akrich 1995), designing a new device is not sufficient to conquer users. Their involvement in the elaboration, design and implementation process seems compulsory to insure the innovation success. This is the issue I want to discuss in the field of housing as it offers an interesting environment to study the interactions between technology innovation and individual and even intimate practices. Akrich, M., 1992. The De-Scription of Technical Objects. Dans W. Bijker & J. Law, éd. Shaping Technology/Building Society. Studies on Sociotechnical Change. Cambridge: MIT P, pp. 205-224. Akrich, M., 1995. User Representations: Practices, Methods and Sociology. Dans A. Rip, T. Misa, & J. Schot, éd. Managing Technology in Society. London: Pinter Publishers. Flichy, P., 2008. Technique, usage et représentations. Réseaux, 148-149, 147-174. Jouet, J., 2000. Retour critique sur la sociologie des usages. Réseaux, 18, 487-521. Mackay, H. et al., 2000. Reconfiguring the User: Using Rapid Application Development. Social Studies of Science, 30(5), 737-757. Pharabod, A., 2004. Territoires et seuils de l'intimité familiale. Un regard ethnographique sur les objets multimédias et leurs usages dans quelques foyers franciliens. Réseaux, 22(123), 85-117. Silverstone, R. & Hirsch, E., 1992. Consuming Technologies. Media and Information in Domestic Spaces, London: Routledge. Woolgar, S., 1991. Configuring the User : The Case of Usability Trials. Dans J. Law, éd. A Sociology of Monsters. London: Routledge, pp. 57-99.

Borders and Boundaries in the Global Earthship Community. *Chelsea Schelly, UW-Madison*

What is the nature of state power, and how is it exercised in modern society? How do boundaries around people, things, and ways of living contribute to the distribution, articulation, and exercise of power in modern society? This paper explores such questions through the case of the Global Earthship Community, a community defined not by territory but by sustainable, off-grid, "green" building ideology and practice. Earthships are built out of tires; they produce their own power, and collect rainwater to supply water for all household needs, including watering an internal greenhouse for food production. Thus, the homes are off-grid (not connected to electricity or water supplies) and contribute to sustainability and environmental conservation (built with tires and producing food on site). Earthship is also a global community of those living in Earthships or supporting the organization/cause through volunteering and participating in online forum discussions. This case elucidates how relations of power affect individuals at the level of technological system use and lifestyle choices, and how state power is exercised through strategies that transcend the national state. Specifically, the Global Earthship Community (as represented by people, building principles, digital and virtual spaces, and sites of defiance and resistance) demonstrates how technologies of government can be used to exercise state power at the level of daily practices and individual bodies in ways that traverse geographical borders while pointing to the power of conceptual boundaries as meaning makers and identity shapers. More than just buildings or houses, Earthships are sites of resistance, demonstrating the global nature of power regimes as deployed through particular practices, such as the building permitting process. This paper uses historical data and sources available online, including heavy reliance on the Earthship website (www.earthship.net) and related discussion forums, to explore how current technological structures and practices (including centralized generation and transmission and reliance on fossil fuels) solidified, simultaneously articulating particular relations of power. Technologies of government serve to reinforce these power relations, which are challenged through alternative technology use. These challenges can be seen in the building permitting processes, which limit the use of alternative technologies. Technologies of government transcend political and territorial boundaries, shedding light on the nature of state power (as located both within and outside of individual states) and how it is wielded (through accepted practices and principles that cut across states as traditional power holders), thus challenging contemporary sociological thinking on the intersections of borders and boundaries. This case contributes new understandings to how technologies are deployed in relations of power, and how the power exercised through technological systems transcends national boundaries or individual nation-states, thus shedding light on contemporary regimes of power, how technologies themselves articulate the particular power relations that configure boundaries around 'conventional' and 'alternative' technological systems, how technologies of government are deployed through practices such as the building permitting process, which transcends national borders, and how technologies serve as a potential means of resisting current regimes of power in the modern world.

Does Technology Tame the Dragon? Culture & Guanxi Gradients of Commerical Pilots. *Carolyn E Psenka, Wayne*

State University; *Allen W Batteau, Wayne State University*

Globalization of commercial flight can be described as the circulation of technical objects to different geographical sites where practices with those objects are replicated, thus extending the network of technical activities into different geographical space. However, the rate of commercial accidents is greater in some regions of the world, with the number of fatal events higher in Africa, Asia, and Latin American than in Europe and the United States. Human factor engineers attribute the variation in national rates to "cultural variables", suggesting the translation of standards for technical objects and practices developed by American and European engineers is "distorted" by cultural assumptions of non-western actors. Is it possible to replicate practices with technologies on a global scale? The work of Jing Hung Sying and his colleagues at National Cheng Kung University in Taiwan found authoritarianism to be the most important of cultural variations in accident causation. From a sophisticated comparison of western and Chinese understandings of authoritarianism, Jing identified what he terms the "Guanxi Gradient". Guanxi is loosely translated from the Chinese as "connectedness". In the cockpit, the capacity of pilots with steep guanxi gradients to follow specified procedures will be more influenced by personal feelings or emotion than those with flat gradients. Jing also suggests guanxi gradients can change over time. Informed by insights from cultural anthropology, this paper discusses the implications of cultural differentiation in actor-networks and possibilities of sustaining safe operation of technologies on a global scale.

Toward a Taxonomy of DIY Technoscience. *Dave Conz, Arizona State University*

From amateur astronomy to backyard biofuels to stovetop synthetic biology, there is a growing international trend, accelerated by internet discussion forums and video sharing sites, of "do-it-yourself" technoscience. This talk will explore the various dimensions of DIY activities including expertise, regulations, social movements, and peer networks. Here I begin to develop a framework for analyzing the various spectra of DIY technoscience. Empirical primary data come from participant-observation of backyard biodiesel manufacturers, urban chicken owners, and content analysis of illicit "moonshine" ethanol culture bolstered by network analysis of internet discussion forums.

040. Transformation of STS in Neoliberal States 2

10:45 to 12:15 pm

5: 521

Neoliberal reforms have changed how science and technology as well as society works. In this period, many critical studies of the negative consequences of neoliberalism, such as the globalization of poverty and the inattention to social rights and social fairness, have been undertaken in the historical and social science fields. However, STS has generally not addressed the problem of neoliberalism with respect to science and technology. Rather, some currents in the STS field may even be viewed as supportive of the transformations. This session therefore aims to take an historical and critical look at how science and technology have changed under the neoliberal reforms, how science and technology policy have accordingly changed, and how STS has changed the direction of science and technology criticism according to these changes. Furthermore, the session will explore the direction of social criticism and science and technology criticism that points to how society or science and technology works according to a standard different from the one presumed in neoliberal thought. Social criticism and science and technology criticism -- that is, STS based on the ideas of social rights and social fairness that the neoliberal thought and policy fails to address -- will be pursued anew.

Participants:

A Shift in Academic Quality Control? Contrasts Between Market-Driven Discourses and Health Scientists' Perspectives. *Mathieu Albert, University of Toronto*; *Suzanne Laberge, Université de Montréal*

Neoliberal ideologies and practices have entered the realm of science policy through the discourse of the knowledge-based economy which links knowledge production to the achievement of national economic competitiveness. In line with these ideologies, a great number of organizations and social actors (e.g., enterprises, governmental bodies, think tanks, academics) have claimed that a "radical" shift in academic knowledge production, dissemination and evaluation has occurred over the last decades. Two models have come to embody these claims: the Systems of Innovation (SI) and the New Production of Knowledge (NPK) models. According to these models, several changes have affected the science system. For example, 1) stakeholders from outside academia are increasingly participating in scientific knowledge production and assessment; 2) quality criteria have expanded beyond those associated with the traditional definition of scientific excellence to include notions such as efficiency and usefulness; and 3) the primacy of peer recognition as a measure of excellence tends to be declining as external stakeholders play a growing role in the assessment of the research project. The argument we make in this paper is that these models do not adequately represent the current regime of knowledge production and assessment in academic science, and that they implicitly comprise a prescriptive dimension calling for the further integration of academic science with industry. Our argument is supported by interviews with 94 scientists from the health research field (31 biomedical scientists, 30 clinical scientists, and 33 social scientists) focusing on their definition of academic excellence and what they think is the best mechanism to assess scientific knowledge production. In contrast to the NPK model, results show that the vast majority of the respondents were clearly aligned with the "traditional" Mode 1 definition of excellence and peer-reviewed procedures for assessing research. They unanimously asserted that peer-review is the most rigorous mechanism for assessing scientific research and wanted their work to undergo such review precisely for that reason. Therefore, they primarily directed their work to other scientists—by publishing in academic journals and giving presentations at scientific conferences—rather than to external stakeholders (such as industry or governmental bodies). Overall, the respondents' insistence on peer assessment as the arbiter of quality clearly pointed to the centrality of peer recognition as the key attribute for the acquisition of legitimacy in the scientific field, and conversely to the low value ascribed to non-academics' judgment of their work. In contradiction with the SI model and, more particularly, with the NPK model, our findings provide little evidence that a novel form of academic quality control has taken place over the last decades. This discrepancy may be explained by the lack of sufficient data supporting the market-driven models (especially NPK) and by their underlying ideological posture favoring neoliberalism.

Nanotechnology, Commercialization of Science, and Neoliberal Transformation of National Laboratories in Japan. *Yasumoto FUJITA, Social Science Research Institute, International Christian University*

A key question for STS scholars interested in science and technology in the neoliberal era is how the commercialization of science has progressed during this period. More specifically, whether or not the increasing research funding from industry has changed academic science drastically is a problem on which many STS scholars concentrate today. It is definitely a critical issue. However, the problem of the commercialization of science cannot be confined to the implications of the increasing private funding to universities. A critical study on the commercialization of science should address a wider area of issues, including the commoditizing of scientific knowledge, the unstable relationship between industry and other institutions for scientific research, and the strengthening of market mechanism in the management of research organizations. For instance, national laboratories should also be focused upon, although they still rely heavily on government funding at least in Japan. This paper aims to present a historical analysis of national laboratories under the Ministry of International Trade and Industry or MITI (renamed the Ministry of Economy, Trade and Industry or METI in 2001), which were consolidated into the National Institute of Advanced Industrial

Science and Technology (known as AIST, the currently largest government research institute in Japan) arguing that it is no coincidence that AIST is one of the enthusiastic advocators of the neoliberal ideology of knowledge production and that it is a leading research institute for nanotechnology. The paper also argues that the neoliberal posture of AIST is neither simply the consequence of its historically invariable role to contribute to the government industrial technology policy nor the consequence of its drastic neoliberal "reform" since 2001; rather, it is the result of its changing or unsteady role in the Japanese research system which itself is embedded in the global political economy. One crucial point is that MITI's research policy shift to basic research far from commercialization in the 1980s, which was a reaction to the US-Japan conflict, paradoxically brought about some conditions for the neoliberal "mode of knowledge production".

The University's Conspicuous Absence: Evidence that STS Is a Neo-Liberal Discipline. *Steve Fuller, University of Warwick*

The classical 'modernist sociological' way of seeing the university - a perspective that unites Durkheim, Parsons and Bourdieu - is an institution for reproducing at least the elite strata of the social order, through which each successive generation is taught (both formally and informally) what they will need to know in the future. This is made possible through the Humboldtian idea of research-led teaching. STS has had very little, if anything, to say about universities - not even their democratization. Instead, STS has focused mainly on one aspect of the university, its research function and, more specifically, the spaces and flows that are defined by research sites like laboratories. In other words, STS tends to treat the university less as a conceptual entity than as a physical entity. Part of this is due to a deep-seated skepticism about the very existence of institutions that relates to the micro-sociological methods common in STS. But also it reflects STS's negative 'postmodern' assessment of the epistemological significance of the university as the producer and distributor of unified knowledge. Together these features have enabled STS to function very well in a policy environment that has wanted to draw attention to a variety of non-academic sources of knowledge, typically in order to justify the withdrawal of central state funding from universities.

The Origin of neoliberal STS: reviewing Hiroshige's work. *hironori ayabe, Waseda university*

The aim of this presentation is to rethink the Japanese STS by reviewing Hiroshige's work. A famous historian Tetsu Hiroshige (1928-1975) produced remarkable achievements not only in internal history of modern physics but also social history of science. Especially his works on social history of science are often referenced by Japanese STS scholars. Nevertheless, we can rarely find discussions critically-revisited his works. Broadly speaking, the origin of STS in Japan goes back to the 1930s. However, it took off after the World War II. But until the 60s, "scientific democracy" is dominated in the dispute over science and society. It called "two wheel of one cart", the proponents of "scientific democracy" explained, therefore, to cultivate scientific attitude of individual own mind was indispensable to nurture democracy. They recognized science was undoubtedly good, so scientists could align with the multitudes against the establishments. Hiroshige sharply criticized it. He insisted it was deceptive for scientists to align with the multitude. They recognized the Japanese science policy before the WWII was feudalistic, bureaucratic and military, and they censured it. But as we know from the history of science policy from Meiji-era, it is proved to be incorrect. We also can grasp a close relationship between science and the establishments from the history of science in Japan. Exactly prewar political system of science which they flatly denied fostered the growth of science. When we take the fact into consideration, how can we critique of science to empower the multitude? There exist two options. One is to leave professional scientist, the other is the multitude do it by themselves such as citizen science. For example, the Right Livelihood Award laureate Jinzaburo Takagi resigned university professor of science and devoted to crusade against nuclear power plant. Or, STS scholars who diverted away from a scientific career toward STS serve as another example. Though not all of them were inspired by Hiroshige's work, his work has influenced almost of all the Japanese mid-career STS scholars. Indeed, Hiroshige's work and activities of his descendants had been of historic significance until the end of the Cold War, but his ideas were the "baby" of the Cold War. Therefore under the condition that neoliberal-reform has prevailed even in Japan, his ideas have been obliged to limit their scope of application. The Japanese STS scholars would be involved in political and economic challenges unless they can critically-revisit his work.

041. How to Convey Science Cafe

10:45 to 12:15 pm

5: 522

Participants:

Introducing a New Style of Science Cafe: Thinking Environmental Issues through the Lenses of Science and Art. *Kayoko Nohara, Tokyo Institute of Technology*

Purpose: This paper investigates how a new type of science communication utilizing innovative, creative media such as paintings, films, animations and computer games function in exchanging information and ideas about cutting edge science and technology issues in the Japanese cultural context. Discussion examples obtained from our science café events will be analysed and demonstrated to show the effect of introducing pieces of art and design in discussing science. Methodology: Discourse analysis of the transcirbed texts and the following description of the features discovered will be made. Significance and contribution: Our present age, concepts such as sustainability, environmental issues, and next-generation energy often become the motifs for the cultural and artistic activity being shared among people. To some degree, the general public develops a consciousness and creates images about these ideas through those cultural/artistic creations. We, Tokyo Institute of Technology (Tokyo Tech) Science and Art Laboratory, have been conducting research on what types of messages through what media are tied to people's image building and are attempting to transmit some messages through the vehicle of art at science cafe events. Tokyo Tech has been developing a number of methodologies to teach graduate students the theory and practice of science communication since 2005. One of the tools often utilised is a science café, where students are taught about the background based on theoretical models developed in the UK. The students, together with a team of teaching staff, artists and designers, apply that knowledge and adapt it to the Japanese cultural context and hold science cafes called "Creative Cafe". We review our experiences in using artistic materials in science cafés in this educational context and also review the value of the science café as an educational tool and conclude that it has contributed to a number of teaching goals related to opinion building and expression skills in science communication. Thus this paper will be a good contribution to STS as it suggests a new, innovative style of science cafe which functions in the Japanese cultural environment and may also work elsewhere.

Making scientific illustrations: communication and collaboration between scientists and illustrators. *Kana Okawa, Graduate School of Knowledge Science, Japan Advanced Institute of Science and Technology*; *Kazuto Kato, Kyoto University*

Scientific illustration is the depiction of objects and concepts in order to record and to convey scientific knowledge. In previous studies, it has been concluded that use of scientific illustrations is effective to promote understanding of science. To create scientific illustrations, some scientists collaborate with illustrators. Successful collaboration among scientists and illustrators is an important element to make effective illustration. On the other hand, it has been suggested that scientists and illustrators occasionally have difficulties in communication, and those difficulties inhibit successful process of making

illustrations. Scientific illustrations have been studied in the fields such as science education, psychology, and sociology of scientific knowledge. In addition, collaboration between scientists and illustrators has been studied by historians of science. In science communication, however, there are little insights on the details of current situation in communication and collaboration between scientists and illustrators. The purpose of this study is to consider what is needed for successful collaboration and communication between scientists and illustrators, by describing and analyzing a case of current status. We would like to show indications gained from two investigations: a participatory observation in producing a brochure, "Stem Cell Handbook", for publicity of a research center, and semi-structured interviews with 11 professional illustrators, designers and art directors. First, from the description by participatory observation we would like to show that collaboration of producing scientific illustrations is a process of creating ideas on the basis of shared knowledge between scientists and illustrators. In addition, it is suggested that different views of deformation of scientific knowledge in illustrations may cause a conflict between scientists and illustrators. Second, we would like to show the results of semi-structured interviews that indicate some illustrators feel difficulties in communicating with scientists because of scientist's negative attitude toward communication, scientist's unclear explanation about their images of illustrations, and restrictions on communication depending on malfunction of institutional systems. It is also suggested that illustrators put emphasis on communicating the understanding of clear message when they discuss deformation of scientific knowledge in illustration. In conclusion, these results indicate that scientists and illustrators need to be aware of each other's special and local knowledge, and communicate and share their knowledge to facilitate collaboration. This shows the necessity of paying more attention to both of scientists and illustrators in the collaboration of creating scientific illustrations. Thus, this study suggests that illustrators collaborating with scientists are important actors in the field of STS and science communication. The implication of this research will provide a new perspective to discussions on these fields.

Storytelling at the Nanoscale: The Case of Researchers' Visual Narratives. *Martina Merz, University of Lucerne*

Science studies scholars are well aware that, within the disciplinary spectrum, humanists and social scientists are not unique in employing storytelling as an epistemic strategy. Also (natural) scientists engage in storytelling as one of the elemental ways of making sense of the world. This raises the question which concepts of narrative might be productive to address forms of storytelling distinct from those observed in the humanities. Such a concept should be plastic enough to adapt to potentially specific modes of narrative in the sciences (e.g. nanotechnology) while simultaneously being to the point, allowing analysts to distinguish narrative from other types of discursive practice. Interesting approaches for such endeavor have been developed in the context of literary scholars' discussion of new media and non-verbal forms of narrative. An example is Marie-Laure Ryan's (2006) multi-dimensional concept of narrative, which comes with a set of conditions providing "a toolkit for do-it-yourself definitions" (ibid. 9). After tracing the conceptual debate, and with reference to it, my presentation will address the lived storytelling practice of researchers in the field of nanotechnology, drawing on data generated through qualitative methods (participant observation, qualitative interviews, document analysis). More specifically, I will focus on "visual narratives". Such narratives are inscribed into various forms of visual representation by their authors and they are made sense of by their viewers. An important example of visual narrative is associated with composite visual displays that occur in research articles. I will argue that such compositions that join and gather several images (especially nanoscopy images), curves and/or schemas within a common frame, complemented by a joint legend, have gained prominence in nanotechnology and other research fields because they allow scientists to tell a story. Meaning emerges from individual visual elements being viewed in the context of and as juxtaposed with other images, schemas, and curves. Visual narratives of this kind constitute important communicative strategies that researchers employ as shortcuts or complements of, or as replacements for non-visual modes of communication.

Overseas Internship as a vehicle for Developing Science Communication Skills and Awareness. *Isamu Amir, Tokyo Institute of Technology*; *Kayoko Nohara, Tokyo Institute of Technology*

This paper reports and suggests how overseas media internship programme at some UK science communication organisations offered by Tokyo Institute of Technology, effectively prompts Japanese graduate students to acquire new skills of science communication and awareness levels, including an enhanced understanding of the importance and complexity of human communications. This internship aims specifically to assist students to learn the importance of communication, and to develop the necessary skills and outlook, through practical experience of activities near the interface between the average citizen and the scientific/technological community at UK organizations such as the Science Museum, the Parliamentary Office of Science and Technology in London, the Walker Institute at University of Reading, In short, this internship can be characterised as acquiring 'backup skills' - by cultivating communication ability as a supplementary skill which can assist in further activating the technical knowledge one already has as a scientist. Through the internships, students are expected to encounter a variety of unexpected situations with potential for miscommunication, and to increase their capacity to cope with inter-community communication gradually. Significance, methodology and contribution: Some of the past internship participants carry on being engaged in science communication activities: they organize a science café and/or join a teaching project at local primary school after their overseas experiences and utilize their newly acquired skills in talking science in their activities. The author of this paper as one of the participants of the internship at the Science Museum in London analyses and describes what he learned during the internship, the effect, some problems found about the scheme and most importantly how to apply the obtained knowledge and skills in the other science communication situations elsewhere. The paper will be a significant contribution to STS as it will demonstrate more potential of media internship scheme in bringing up young researchers with science communication capabilities in Japan.

042. Time and Biological (2)

10:45 to 12:15 pm

5: 523

Participants:

The Time of Slime: Anthropocentrism in Harmful Algal Research. *Astrid Schrader, Sarah Lawrence College*

In recent years, so-called Harmful Algal Blooms (HABs) have become a major environmental concern, affecting costal water around the globe. HABs are associated with an explosive growth of microscopic algae due to nutrient over-enrichment of coastal waters, and are sometimes accompanied by the production of toxins. The increased frequency of the occurrences of HABs worldwide, which marine ecologist Jeremy Jackson has called the 'rise of slime', threatens to suffocate major taxa of life in the ocean. HABs endanger the livelihood of sea mammals, birds, and fish and also adversely affect human health. Marine scientists, however, make no attempt to hide the anthropocentrism in the notion of 'harmful algal blooms'. Harmfulness means either directly harmful to human health or the altering of "ecosystems in ways humans do not like" (Cullen 2008). While the factors controlling HAB development are not well understood, HAB research focuses on the mitigation of their economic impact (the cost associated with the reduction in tourism, beach closures, shellfish beds and the catch from fisheries) through the

development of early warning systems. This paper explores how the anthropocentrism in the notion of harmfulness of algal blooms becomes embodied in detection technologies that attempt to predict the future in 'real time,' while erasing the temporality of microorganisms preconceived as 'harmful species'. I ask what conceptions of time and species enable a mapping of the biological productivity of microorganisms onto economic productivity or the loss thereof and how specific detection technologies circumscribe what counts as an environmental threat. In more general terms, I explore how an epistemological anthropocentrism that draws fundamental distinctions between human subjects and their objects of study in terms of their temporalities affects the definition of an environmental problem in anthropocentric terms, precluding matters of environmental concern beyond specific human economies. Focusing on the relationship between anthropocentrism and specific conceptions of time, this paper contributes to an increasing concern in STS with the entanglement of ontological assumptions in scientific knowledge production and their possible ethical/political consequences.

In Vitro Meat: a new temporality of food? *Neil Stephens, Cardiff University*

In Vitro Meat is the growth of muscle tissue in laboratories with the intention of developing it for consumption as food. Essentially a form of stem cell science, it takes tissue engineering techniques from the biomedical field into the world of agriculture. While the complex temporalities of biomedical stem cell science has been discussed in the literature (Brown & Webster) and elsewhere within this panel (Lee), little attention focuses on the challenges of stem cell technologies in our diets. In her 1998 book 'Timescapes' Barbara Adam wrote: "In agriculture, more than any other industry there are limits to the extent to which seasonal and daily variation can be rationalised to conform to a decontextualised and de-temporalised standard. Plants and animals are ineradicably tied to the rhythmicity of nature and the cosmos: their physiology is determined by it. Their maturation processes are tied to it. Their reproductive cycles oscillate in synchrony with it." Ten years later, at the first meeting of the In Vitro Meat consortium in 2008, these assumptions were profoundly challenged. Claiming the technology has clear advantages for the environment, our health, and animal welfare, the consortium predicted their tissue could be entering the food chain within twenty years. By aligning their technology with both an expectation of success and the promise of a socially responsible food stuff the consortium members seek to open up a discursive space for the tissues commodification. The paper draws upon interviews with In Vitro Meat scientists and documentary analysis to inform an STS account of this emerging, yet marginalised, field. I will articulate the re-configurations of temporality these scientists imagine in terms of agricultural production, animal kinship, and human consumption. I will close by raising questions about what this dislocation of meat production from the rhythmicity of nature could mean for us as ethically and temporally situated consumers of food.

Financialisation of the Biosphere: Securitisation, Triage and the Extinction Debt. *Jeremy Walker, University of Technology Sydney*

The transformation since the 1970s of international economy by financial deregulation, and the transformation of finance by the rapid evolution of derivatives, now meets the "convergence of the capital markets and the environment" (Fusaro and Yuen 2004). Market-based climate reform, while proceeding at a glacial pace, amounts to a partial 'financialisation' of the carbon cycle and its attendant crises. Using the same logic at work in global carbon trading, economists propose that the loss of abundance, biodiversity and ecosystem function that comprises the Sixth Mass Extinction can only be rectified if ecosystems are plugged into the distributed computation of markets, and to this end are designing market 'instruments' and 'mechanisms' to allow global trading in 'biodiversity and ecosystem services' . The deep time of the earth's history of speciation and punctuated by mass extinction events will then presumably be 'integrated' into the rapid volatilities of futures markets, as they continually act to discount, reprice, hedge against and speculate upon (and indeed generate) critical future events on the global scale. Such proposals for the planned evolution of forms of 'natural capital' and the securitization of ecological risks (such as extinction) are unique in that they further smudge the boundaries between ecological risk managment and neoliberal finance theory. In line with the attempt to deliver 'sustainable growth' through the interpolation and alignment of 'financial evolution' and the privatization of 'ecosystems services', the paper identifies some interesting convergences between international conservation NGOS and global merchant banks.

Quitting Rights over Unfinished Labor. *Jieun Lee, University of California, Davis*

Human embryonic stem cell (hESC) research demands donation of reproductive materials—mostly human embryos from in vitro fertilization (IVF) labs. This paper discusses how informed consent practices, the transferring of rights over the biological from donors to scientists, plays a crucial role in demarcating reproductive and productive labor in hESC enterprise. While informed consent is supposed to be an instrument to ensure the donor's rights "to know" before giving away biological materials, its language also makes it clear that donors do not have any claim on the profit that will be generated in the future. As other scholars (e.g., Sarah Franklin, Catherine Waldby, Melinda Cooper, Charis Thomson) have discussed, vitality of the donated biological materials is crucial in the current state of hESC research. In this sense, hESC research can be seen as capitalizing on the reproductive labor in IVF clinics. I am interested in how to account for the donor's labor extended in time through transferring the biological for its further temporal and spatial modification. While donor's intended reproductive labor is complete in IVF clinic, relocation of the reproductive tissues adds another dimension to their labor in relation to hESC research. Donors are a part of the relation of hESC production, although their labor is not acknowledged that way. Analyzing a sample informed consent document prepared by International Society for Stem Cell Research, this paper explores the donor's reproductive labor as it is untangled from hESC production through the consenting practice. By attending to the consenting practice that obscures temporal and spatial extension of the donor's labor through the biological by the suspension of rights (and relation between the donor and the material), this paper attempts to contribute to our understanding of novel configurations of time and labor in biocapitalist mode of production.

Bleeding Time: Temporality in Discourses of Menstrual Suppression. *Katie Ann Hasson, University of California, Berkeley*

Recently introduced birth control pills, such as Seasonique and Lybrel, are specifically designed to allow women to skip or eliminate their periods. While "menstrual suppression," or the practice of using synthetic hormones to reduce or eliminate monthly bleeding, has been both possible and informally practiced since the introduction of the birth control pill, the development and sale of birth control pills specifically designed to reduce or eliminate bleeding is novel and represents a major shift in the design of the pill. Medical rationales for menstrual suppression draw on two images of the rarely-menstruating woman, each with a distinct temporality. In one, the woman suppressing menstruation is represented as the modern woman of today (and the future), who needs the "convenience" of controlling her menstruation through hormonal contraception. In the other, the monthly-menstruating woman is presented as an anomaly and product of modernity, while menstrual suppression represents a return to a natural state of infrequent menstruation due to pregnancy, lactation, or caloric restriction. The imagined "ancestral" woman of this natural state is figured as the (contemporary) woman of the Savannah, whose "pre-modern" way of life stands in for originary nature. Both temporalities -

modern perfection through technological intervention and the return to a natural past - circulate in medical accounts of menstrual suppression technologies and their ideal users. Further, as makers of these pharmaceuticals work to construct and configure users through marketing discourses, potential users are asked to consider and take up through embodiment these overlapping articulations of future (modern woman) and past (ancestral woman). In this paper, I examine websites promoting these pills - and the practice of menstrual suppression more generally - alongside medical journal accounts of menstruation and menstrual suppression, with an eye toward the conceptions and articulations of time at work in their constructions of ideal users. I argue that both medical accounts of menstrual suppression and marketing discourses collapse future and past in the body of the rarely-menstruating woman, in the service of normalizing new temporal cycles for menstruating bodies. As "technologies of gendered bodies" these pills produce bodies and cycles that are "more natural than natural" (Balsamo 1995; Mamo and Fishman 2001). Theories of biomedicalization (Clarke, Shim, Mamo, Fosket, and Fishman 2003) and "life itself" (Rose 2007) urge us to attend to the possibilities of enhancement and optimization opened up through intervention into the body's most basic processes. This study contributes to this literature through examining the complex articulations of temporality, biology, nature and gender that connect the techno-enhanced, non-menstruating bodies of the present and future to the "naturally" non-menstruating bodies of an imagined ancestral past.

Chair:

Jieun Lee, University of California, Davis

043. Medicine and Gender in Global/Local Politics: Session (2) Moral Practices and the Ethics of Family

10:45 to 12:15 pm

5: 524

This panel, Medicine and Gender in Global/Local Politics, is composed of three sessions. Each session examines medical knowledge, technology and/or medical systems from East Asian viewpoints. Based on empirical data concerning medicine, each paper raises issues on body and gender in the context of women's actions, nation, culture and society. Our goal for these sessions is as follows. First, we convey commonalities and diversities among South Korea, Taiwan, and Japan. Comparative study brings new knowledge and interesting questions to research on medicine and gender. Second, we believe that a comparative approach will allow us to reconsider medicine and gender issues as grounded in imperial and colonial history within both global and local contexts. We hope to prompt common understandings and future collaborative projects among presenters and participants of our sessions. In session (2), the panelists will discuss some moral dilemmas and ethical decisions that medical practitioners and expecting mothers are facing in UK, Japan, and Korea. This panel is particularly interested in the issue of family: how the medical technologies in East Asia are shaping and being shaped by the social relationships of family, gender and citizenship. First, Young-Gyung Paik' presentation is about the changing ontological politics of life and the "pro-life" activism in South Korea. Paik argues that the changing politics of life and abortion is emerging through the complex web of the development of medical technologies that can keep premature babies alive, the decreased interests in human embryonic stem cell research, the rise of disability activism, and the state concern of depopulation. Second, Eunshil Kim will present "Prenatal Screening Practices, "Superior Gene" Discourse and New Biological Citizenship in South Korea." Based on the interviews with pregnant women and on the analysis of the media representations of prenatal screening and "superior gene," this paper will examine the changing expectations about prenatal screening practices and the regulations of them, and, accordingly, delineate the ways in which a new form of biological citizenship emerges at the crossroads of the intervention of newly available medical technologies, the traditional social relationship of family and gender in contemporary South Korea. Third, Setsuko Sugano's presentation on the prenatal screening in Japan will follow. Based on interviews and surveys, Sugano's presentation "Pregnant woman's selection in prenatal testing: amniocentesis and multiple marker screening in Japan" will provide a detailed analysis of the motivation, considerations, and predicaments that pregnant women in Japan are experiencing during the practices of prenatal testing. Finally, Maiko Watanabe' presentation "Public Legitimization of a New Medical Technology: Research and Development of Maternal Serum Screening Test in the UK" argues the key to the public legitimization of antenatal screening technology lies in the approach towards life with disability that society should take. Watanabe claims that, in order to generate the public legitimization of antenatal screening technology in the future, it is necessary for the public to consider a variety of possible approaches that society can take towards life with the targeted condition. This presentation will add a valuable comparative perspective to the East Asian cases that the session will discuss.

Participants:

Changing Ontological Politics of Life:Pro-Life Activism, Abortion, and Depopulation Crisis in South Korea. *Young-Gyung Paik, KAIST*

This paper investigates the recent South Korean state of affairs in which pro-life activism has suddenly gained prominence in its public sphere at the crossroads of changing medical ethics, national depopulation crisis and biotechnological development. In the US context, it is often noted that the debate about human embryonic stem cell research has been framed by the binary opposition of pro-life versus pro-choice and that even the opponents were divided over the ontological status of embryo and women's right to abortion. The position regarding abortion has been the benchmark of conservatism and liberalism in many Western countries. In South Korea, in contrast, even during the midst of stem cell research scandal, the debate on abortion was absent from the public concern about destruction of embryo. On the one hand, the South Korean progressive critics of human embryonic stem cell research generally adopted a pro-choice or pro-reproductive rights stance but tried to prevent the issue of abortion from making its way into the public debates. They feared the issue of abortion would overwrite the public discussion about human embryonic stem cell research as it did in the US. At the same time, the state that had almost encouraged abortion as a means of population control for economic growth was reluctant in entering into the anticipated polemical debate on abortion. On the other hand, the anti-abortion activists, in fiercely opposing to human embryonic stem cell research, could have exercised only limited public influence due to its strong religious orientation and categorical denial of abortion. It was only after the formation of the group of doctors called "Pro-life Doctors" in 2009 that the contentious issue of abortion started to gain public attention in South Korea. In their opinion, the South Korea's low fertility rate has originated from its high abortion rate, which, in turn, was the result of the immoral and profit-oriented conducts of Korean medical doctors. As the state expressed its official support for the anti-abortion group for the first time in history, the political terrain of abortion politics in South Korea is changing drastically since last year. Although rather simplistically understood as the war between doctors by the media, this paper argues, the changing politics of life and abortion is emerging through the complex web of the development of medical technologies that can keep premature babies alive, the decreased interests in human embryonic stem cell research, the rise of disability activism, and the state concern of depopulation. Based on the interviews with "Pro-life Doctors", the advocates of abortion rights, policy-makers as well as researchers in life sciences in South Korea, this paper aims to serve as a case study of the entangled relationship among gender, body and medical technologies in East Asia.

Prenatal Screening Practices, "Superior Gene" Discourse and New Biological Citizenship in South Korea. *Eunshil Kim, Women's Studies Program, Ewha Womans University*

The popular discourses on "superior gene" can be easily found in the internet portal site news in South Korea. Usually the stories of superior gene are applying to family stories about popular cultural figures such as actors, actresses, singers etc., saying that it is not only beautiful stars themselves who are beautiful but also their mothers, brothers and sisters are beautiful and talented. Popular stars' physical attractiveness originally is seen as coming

from their genes. In order to have superior genes, marrying to a person who owns superior gene is needed, and biotechnological interventions are required if needed. In this paper I will explore the way in which (1) superior gene discourses are constructed in terms of physical 'perfectness' or 'superiority': (2) what kind of biotechnological interventions are practiced to prevent the biological defects of fetus during pregnancies: and (3) how the idea of biology is framed in relation to the reproduction of family and the success of family. Based on the interviews with pregnant women, on the analysis of the media representations of prenatal screening and "superior gene," this paper will examine the changing expectations about prenatal screening practices and the regulations of them, and will, accordingly, delineate the ways in which a new form of biological citizenship emerges at the crossroads of the intervention of newly available medical technologies, the traditional social relationship of family and gender in contemporary South Korea.

Pregnant woman's selection in prenatal testing: amniocentesis and multiple marker screening in Japan. *Setsuko Sugano, Rikkyo University*

This report describes the execution condition and the problem of the prenatal testing in Japan from the interview and the questionnaire survey to women. According to the contract research of the Ministry of Health, Labour and Welfare, as for the amniocentesis and the multiple marker screening, only 1-2% is executed. On the other hand, it seems that most pregnant women have frequently received the ultrasonic echo in the pregnant woman health examination. Japanese society was wary of prenatal testing. The group of experts limited the condition of the pregnant woman who was able to receive the amniocentesis. The Ministry of Health, Labour and Welfare told "Opinion of the multiple marker screening". The doctor is requested to do informed consent and the counseling enough to the pregnant woman there. It was written, "The doctor did not have to inform the pregnant woman of information on this testing positively, and should not recommend this testing", and was controlled the dissemination from the doctor. First of all, the lack of information from the doctor is thought as for the low degree of the execution rate of the testing in Japan. However, is the reason why the testing is not undergone only it? Why does the person who has received it receive it in the meantime? It has been understood that not providing information was interpreted as meaning that they did not need according to the research of the reporter. And, it was influenced from doctor and husband's opinions. As the reason of not want to know fetal sickness, I have understood it is difficult to keep conceiving the fetus who has the sickness when hoping to continue getting pregnant. Fetal sickness is not accepted easily because a healthy fetus can be imaged by seeing fetal appearance in the ultrasonography. Moreover, information on handicapped child is a little. Some pregnant women received the testing because of fear to have handicapped baby. However, there was an example of receiving the prenatal testing for the unintended pregnancy to look for the reason for the abortion. Even if it was admitted to abortion in the law, it is difficult to do when it was contrary to surroundings or was not able to determine the abortion. But selective abortion was not made an express statement when permitted legally. Women who abort selectively actually suffered for a permissible in Japanese society, legal, ethical non-allowance.

Public Legitimization of a New Medical Technology: Research and Development of Maternal Serum Screening Test in the UK. *Maiko Watanabe, Department of Public Policy, Institute of Medical Science, The University of Tokyo*

The aim of the proposed paper is to discuss the issue of public legitimization of new medical technology, through a case of antenatal screening for Down's syndrome in the UK. It is based on ethnographic study of agents involved with the technology; inventors of the technology, medical practitioners, pregnant women, and people with disability and their families, especially parents. The proposed paper is interdisciplinary based on mainly two frames of reference; Science and Technology Studies and Disability Studies. The former equips the proposed paper with the basis to understand the process of invention and promotion of the technology, in the social context. I will especially focus on transformation of rhetoric to legitimate the technology in its process. The latter provides the critical standpoint to observe the fundamental idea of antenatal screening that it is better to prevent life with disability. Today, provision of antenatal screening is commonly legitimated for its ability to enhance autonomous decision of women in the clinical setting. However it is questionable whether women can make reliable autonomous decisions, when they can only imagine the immediate consequences of their decision (Rapp and Ginsburg, 2001). Based on the idea of disability studies, I will argue that the key to the public legitimization of antenatal screening technology lies in the approach towards life with disability that society should take. The process of social acceptance of antenatal screening for Down's syndrome in the UK indicates the difficulty of serious examination of alternatives to the preventive medical approach towards disability that this technology offers. I conclude that in order to generate the public legitimization of antenatal screening technology in the future, it is necessary for the public to consider a variety of possible approaches that society can take towards life with the targeted condition.

Discussant:

Kaori Muto, University of Tokyo

044. STS and Carbon Capture and Storage (CCS) - Beyond publics

10:45 to 12:15 pm

5: 531

Carbon Capture and Storage/Sequestration (CCS) has emerged over the last two decades as an attractive policy solution squaring the circle of secure, affordable power supply and the need to decarbonise our energy system. The technology has emerged over a relatively short period of time, but is claimed to be already quite mature, since it draws on technology tested in other applications. Nevertheless, large uncertainties remain, with regard to both core technical issues like the scaling up of capture processes and security of storage in aquifers, and other issues like public understanding and economic considerations. The impression given is that of a 'double exposed' image of a technology that is both mature and in need of substantial further development. Given the novelty of the technology and its perceived importance for climate change policy, there is plenty of scope and need for STS type studies of CCS. STS has had, in its engagement with CCS, a relatively strong focus on public understanding and engagement (see Shackley and Evar, 2009, for a review). There is also a growing STS literature on other aspects of CCS, with a broad range of substantive topics (for example, stakeholder roles and interests, Stephens, 2006, and expert opinions, Hansson and Bryngelsson, 2009) as well as theoretical and methodological approaches (for example, innovation systems, van Alphen et al., 2009, and techno-institutional complexes, Unruh 2000, 2002 and Unruh and Carrillo-Hermosilla, 2006). A key aim of this session is to map out more clearly what STS can contribute to our understanding of CCS, in addition to public understanding and engagement. The first paper by Markusson addresses the role of CCS in enhancing fossil fuel lock-in risks or escaping it via application on biomass, drawing on conceptualisations of lock-in, innovations system strengths and the multi level perspective on system transitions. The second paper presented by Ishii is an empirical exploration of social learning processes in and around CCS demonstration projects. This paper contains findings on the importance of framing and governance arrangements for social learning for CCS demonstration learning, and lays the foundations for a conceptual approach to this topic. The third paper by Russell builds on this theme by presenting a theoretical exploration of CCS demonstrations, their socio-technical system context and the related processes of knowledge production. Finally, Hansson presents a paper on how visions and expectations of CCS are constructed in multiple settings: media, energy scenarios, conferences and research. A second aim is to identify gaps in the research. Questions to discuss could include the following. What kind of constructivist studies about how facts about CCS technologies are established would we like to see? Within the broader STS area, can studies drawing on interpretative traditions in disciplines including sociology, geography and politics contribute more than they have done so far?

Participants:

CCS, BECCS, and the escape from fossil-fuel lock-in. *Philip Vergragt, Tellus Institute*; *Nils Markusson, University of Edinburgh*; *Henrik Karlsson, Biorecro AB*

Carbon Capture and Storage (CCS) is increasingly depicted as an important element of the CO2 mitigation portfolio. However, critics have warned that CCS might lead to (reinforced) fossil fuel lock-in, by perpetuating a fossil-fuel based energy provision system. Due to large-scale investments in CCS infrastructure, the fossil-fuel based 'regime' would be perpetuated to at least the end of this century. In this paper we investigate if and how CCS could lead us away from reinforced fossil fuel lock-in. First we develop a set of criteria to estimate the degree of technological lock-in. We apply these criteria to the fossil fuel socio-technical regime, to CCS, and to a newly emerging niche called BECCS (Bio-Energy CCS) In principle, CO2 could be captured from any CO2 point source. In the practice of present technological innovations, business strategies, and policy developments, CCS is most often coupled to coal power plants. However, there are many point sources of CO2 that are not directly related to fossil fuels. For instance, many forms of bio-energy or biomass-based processes generate often rather pure streams of CO2 emissions. Capturing this CO2 which was originally sequestered in biomass could theoretically lead to negative CO2 emissions (net CO2 sequestration). In this paper we use the functional approach of Technical Innovations Systems (TIS) to estimate in more detail the strengths of the niches Fossil Energy CCS (FECCS) and BECCS, and to compare them with each other. Next we develop pathways for developing FECCS, BECCS, and other options, using transition management concepts. The outcome is that a large-scale BECCS development could be feasible under certain circumstances, thus largely avoiding the risk of enhanced fossil fuel lock-in.

The Social and Political Complexities of Learning in CCS Demonstration Projects. *Nils Markusson, University of Edinburgh*; *Atsushi Ishii, Center for Northeast Asian Studies, Tohoku University*; *Jennifer Stephens, Clark University*

Demonstration of an integrated power plant with carbon capture and storage (CCS) at scale has not yet been achieved, despite growing international political discourse surrounding the potential of the technology to contribute to climate change mitigation. Acknowledging the scale of social learning that still must occur, high expectations are associated with current and planned CCS demonstration projects. Partly because of these high expectations, contestation of project plans and outcomes can be anticipated. How the projects are framed by the project owners and other stakeholders will be an important factor shaping debates around the projects. From a Science and Technology Studies (STS) perspective, emerging CCS demonstration projects are fertile ground for studying the social aspects of technology demonstration and innovation. Information sharing mechanisms and learning expectations are often debated components of the initial design of the demonstration project, and issues of transparency, engagement and evaluation often become critical. This research explores CCS demonstration in three wealthy countries with very different histories and contexts for CCS: Japan, the USA and the UK, to provide valuable insights on how the social context shapes the learning from demonstration projects. Through an exploration of three specific demonstration projects in these three countries, this paper explores the social aspects of learning through CCS demonstration by focusing on the following research questions: 1.What were the major differences in stated goals and expectations of demonstration projects, how were these goals and expectations framed by different actors and how has those frames impacted on the social learning? 2.How has the social learning processes relating to CCS demonstration projects been shaped by societal processes, including the inclusion and exclusion of actors and engagement with publics and critics? A key finding is about how governance arrangements matter for learning. Competitive funding arrangements in the US and UK cases shaped the learning processes, and both limited information exchange for reasons of competition, as well as stimulated learning at multiple sites/in multiple projects. The corporatist technocratic governance model in Japan facilitated learning between industry and government actors, but limited the exchange with civil society.

What will CCS demonstrations demonstrate? *Stewart Russell, University of Edinburgh*

Great expectations have arisen around planned CCS demonstration projects, and we can anticipate intense scrutiny and public contestation. CCS demonstrations are costly and need to be rapid. All this forms a challenging context for establishing reliable judgements on the properties and future of CSC. Drawing on STS material on demonstrations and testing, and the limited existing empirical work on CCS demonstrations, this paper explores how the specific character and circumstances of CCS innovation - their design, organisation and control - will affect the outcomes. It also considers how these demonstrations may come to be seen - by industry, policy makers, critics and other onlookers - as successful or not. STS perspectives have much to contribute, particularly through their focus on the structure of socio-technical systems and the processes shaping them, and on the dynamics of knowledge production in and around technologies. They can contribute by clarifying the complex relations between demonstration, other elements of the system of innovation, and the wider context; and by highlighting the often neglected social and political dimensions of demonstration. This paper builds on the useful analysis by Rosental (and related work by Shapin and Schaffer) of demonstration as an event performed by a demonstrator in interaction with artefacts and audiences. It also draws on STS treatments of testing; following Spinardi and Collins, it considers the tension in demonstration efforts between the need to perform realistic tests of the technology and learn about its performance, and the need to ensure a display of successful results. STS work on systems and configurations, are also important in understanding how realistic are the representations of the system being demonstrated, and the implications of demonstrations not being conducted on the whole system. The analysis has implications for attempts to develop robust and acceptable procedures for CCS demonstrations, and related policies. The paper proposes an approach to managing CCS introduction based on constructive technology assessment. The unique characteristics of CCS demonstrations - a highly politicised example and the rapid emergence of an already supposedly mature technology - promise in turn new insights for the development of STS treatments of demonstration.

Chairs:

Nils Markusson, University of Edinburgh

Atsushi Ishii, Center for Northeast Asian Studies, Tohoku University

045. Ethics, Philosophy and Governance of Neuroscience in East Asia.

10:45 to 12:15 pm

5: 532

The rapid development of neuroscience in recent years has brought growing attention to the ethical, legal and social implications (ELSI). This has given rise to neuroethics as an independent field devoted to increasing understanding of ethical and social issues related to neuroscience research and its medical applications. Among the most pressing challenges facing the field is communication and engagement with the public: we observe that scientifically unreliable information is widely distributed by the media, and even by scientists themselves, who are eager to advance the latest technologies. An example is the emerging technology of brain-machine interface (BMI), which is progressing rapidly despite much uncertainty over the risks in relation to benefits. Given the centrality of the brain, the organ of "mind," in neuroscience research, social and ethical concerns are likely to become even more pronounced as technologies move out of laboratories and into the clinic and market, creating new challenges for public communication and management of the

technology. For STS researchers, neuroscience is a test case for judging the effectiveness of tools and approaches for public engagement and governance of science and technology, as well as understanding how the intersection of scientific, ethical, political, and social forces shapes the approaches to governance of neuroscience in different countries. Of particular interest to our panel is the identification and study of local cultural factors affecting public engagement with and governance of neuroscience. Although responses to this technology may partly reflect shared universal inclinations and values, the relationship between science and society is also mediated by cultural and historical circumstances. The neuroscience-society relationship may be affected by differences in ethics and epistemology regarding the mind-body problem, human-animal relationship, and relations between humans and non-living entities such as humanoid robots. Historical, institutional, and cultural circumstances also figure in the relationship between scientists and the public, role of mass media, social position of scientists, and the capacity of the scientific community to influence the political process. Our panelists investigate effects of culture, history, institutional context, and ethics in shaping public engagement with neuroscience across East Asia. We situate our findings in relation to the STS literature and discuss the implications for future STS research on neuroscience and neuroethics. We hope that our panel will be a first step to a more fruitful relationship between neuroscience and the public, especially in East Asian countries.

Participants:

Neuroethics meets Culture. *Dayk Jang, Seoul National University*

For the past few years, neuroethics has addressed ethical, legal, and social implications of the current and/or coming neuroscience and technology. Most researchers in neuroethics, however, have focused largely on the findings which are often implicitly assumed to be universal in term of neurophysiology, brain imaging, and psychopharmacology. The universality assumption in neuroethics might be caused mainly by just following the dominant trend in neuroscience. But we are a cultural species. We think, feel, choose, and reflect in cultural contexts in which we develop. Our brain and mind have been shaped by cultural traditions and individual experiences. For the several decades, social psychologists have provided very rich evidences for cultural influences in human cognition: East Asians are better at engaging in holistic thinking than Westerners who have been shown to primarily exhibit analytic thinking. Beside, the new fields such as cultural neuroscience and neuroanthropology are just emerging recently that investigate cultural variations in neural processes. They began to address the question of whether neural correlates and processing of mind are culturally dependent or invariant. In this presentation, I will investigate the theoretical issues in cultural neuroscience and the empirical evidences for how significantly and differently cultural values, beliefs, and practices shape the brains in the different contexts of culture. Then, the ELSI of cultural neuroscience will be discussed. This investigation addresses new questions of how possible the East Asian neuroethics is and what it is supposed to be. Those questions about cultural aspects, together with the 'old & new questions' in neuroethics will enrich the current discussion on ELSI of neuroscience.

How is Public Perception Different from Expert Perception about BMI (Brain-Machine Interface) ? : Toward Constructing the Relationship between BMI and Society. *Taichi Isobe, University of Tokyo*; *Nozomi Mizushima, University of Tokyo*; *Osamu Sakura, University of Tokyo*

1 Introduction We always confront difficulties when new technologies are introduced into society. Therefore, it is important for experts and the society to formulate an effective plan to identify ethical and social problems at the early stages of research. Understanding audiences is the first step in effective communication (Rogers, 1999). We have focused on BMI (Brain-Machine Interface) as an emerging technology in neuroscience, because research on BMI is crucial for rehabilitation and medical applications in neuroscience. BMI is a technology that can decode and control information in the brain, elucidate brain functions, and recover and supply brain and physical function (SRPBS). We presented one part of exploratory results and discussions as the same topic at 4S conference (2009). In this time, we will present complete results and discussions by analyzing with Modified Grounded Theory Approach (M-GTA) which we did not use for the presentation in 2009 . 2 Purpose & Methodology We conducted semi-structured interviews with general public and BMI experts. The number of general public was 8 (female: 3, male: 5) and experts was 4 (female: 0, male: 4). Referring to nanotechnology surveys (Cobb & Schutz, 2004), we clarify how general public and experts perceive BMI and analyze the differences between these two perceptions. Research items include the general image, risks, benefits, and the relationship between experts and society about BMI. We use a Modified Grounded Theory Approach (M-GTA) to analyze the date. 3 Results & Discussions We found 24 concepts (concept indicates [ ] as below) for public perception and 10 concepts for expert perception. After analyzing each concept, we compared the same concept between public perception and expert perception. There are 6 same concepts between these two perceptions such as [The influence from SF and animation], [treatment & rehabilitation and enhancement] and [the necessary of communication]. One result and discussion, for example, is [treatment & rehabilitation and enhancement]. General public indicates the difficulty to make clear line between enhancement and rehabilitation. To consider BMI, the rehabilitation possibility will be enhancement because enhancement is on the line from rehabilitation which makes people be better than current situation. On the other hand, expert suggests the research of enhancement is nearsighted. If BMI researchers make possible to create enhanced human, they do not have concrete prospect of future research and benefit. Expert perception is formed to recognize benefit about BMI.   4. Conclusion There are a few similarities between public perception and expert perception, but there are differences between most of these perceptions. The reason is, though general public have the perspective from user and recipient about BMI, expert have the perspective from researching to BMI; they have the different framing. It will be crucial for them to understand the different framing and communicate each other in emerging stage of science. Acknowledgment: A part of this study is the result of "Brain Machine Interface Development" carried out under the Strategic Research Program for Brain Sciences by the Ministry of Education, Culture, Sports, Science and Technology of Japan.

Neuroethics in Taiwan: could we have a Confucian neuroethic? *Kevin Chien-Chang Wu, Department of Social Medicine, National Taiwan University College of Medicine*; *Tamami Fukushi, Center for Research and Development Strategy (CRDS), Japan Science and Technology Agency (JST)*

Kevin Chien-Chang Wu will address the development of neuroethics academia in Taiwan and the potential for a Confucian neuroethic. His talk includes the short history of booming attention to neuroethics both in ethics and neuroscience academia in the past three years. In 2007, the ELSI branch of Taiwan National Research Program for Genomic Medicine (NRPGM) has officially name neuroethics as one important grant topic. In 2009, Taiwan National Science Council has created grants to set up devices for fMRI (functional magnetic resonance imaging) and MEG (magnetoencephalography) for humanity studies. He will show that although there were international conferences or exchanges on issues related to neuroethics in Taiwan, a unified neuroethics academic community out of current multiple institutes and centers of neuroscience, bioethics and humanity in Taiwan is yet to emerge. As regards the contents of neuroethics research, he will describe the initial efforts of scholars in Taiwan to examine neuoethics in a Confucian society with both ethical reasoning and empirical studies. As an example, he will present the preliminary results of a survey conducted by Wu et al on the attitudes of mentally ill patients and their families towards donating post-mortem brains for neuroscience research. Also, he will address how the Confucian perspectives on human

nature could be compatible with booming neuroethics. Finally, he will explore the possibility of constructing a regime of democratic neuroethics research in Taiwan at its early stage of neuroethics academia development.

Toward an East Asian Neuroethics. *Steven Collins, University of Washington Bothell*

Recent advances in understanding of brain function, increasing use of imaging and other technologies for probing and manipulating the brain, and advent of technologies for enhancing cognitive performance present new challenges for ethical, socially responsible, and democratically accountable governance of scientific research. The new interdisciplinary field of neuroethics has emerged in the past decade to engage these developments, which lie at the intersection of neuroscience, ethics, law, philosophy, social policy, and medicine. Following a pattern seen before in bioethics, efforts are underway to build an international consensus around neuroethics that appeals to universal values while respecting moral and cultural diversity. However, to intervene in and manipulate brain function is to interpose technology into the very part of the body that is the seat of consciousness and the source of individual identity. Because beliefs about the nature of consciousness and the relationship between mind and body vary across cultures, approaches to neuroethics are also likely to vary. Research in cultural psychology, moreover, suggests a cultural influence on cognition, with East Asians showing a propensity for holistic reasoning, which identifies an object in relation to points of reference in its surrounding environment; Westerners, by contrast, show a tendency for analytical reasoning, which apprehends the object without reference to the space surrounding it. These differing conceptions of the self and its relationship with the environment, and of the relationship between phenomena and their context, suggest the possibility of an East Asian neuroethics distinct from that of the West. This paper explores this possibility and the implications for STS. Drawing on the philosophy of mind and the mind-body relationship in the writings of 20th century Japanese philosophers Nishida Kitaro, Watsuji Tetsuro, and integrating perspectives from Buddhism and contemporary East Asian bioethics, it addresses the prospects of an East Asian neuroethics, drawing comparisons with Western understandings.

"Why Is English So Difficult for Koreans to Master?": The 'Language Brain' and Neuro- determinism in Korea. *Sungook Hong, Seoul National University*; *Ha Won Chang, Seoul National University*

In Korea, neuroscience is considered to be the "last frontier of science" in the 21st century. As neuroscience progresses, popular books and newspaper articles on the human brain are increasingly published. The production of neuroimages such as fMRI images is in actuality characterized by procedural complexities and methodological uncertainties; those images shown in the newspapers and on TV are the result of active interpretations and negotiations. The public, however, has a strong tendency to view such images as transparent "pictures" that reveal the physical reality corresponding to the function of human mind on the brain's level. The role of these images, however, is not limited in delivering a simplified version of scientific knowledge to the public; instead, they also play a role in the production of scientific knowledge. In this paper, we will take "language brain" images that are popular in Korea, and analyze how the result of neuroscientific researches is used in the public adoption of these images, and then how these images contribute to the production of new neuroscientific studies. This study will reveal some interesting features in the media representation of neuroimages, and contribute to understanding a complicated relationship between science and the public via neuroimages.

Ethics Consultation in the Midstream: Implications for Scientific Governance from within. *Nozomi Mizushima, University of Tokyo*; *Taichi Isobe, University of Tokyo*; *Osamu Sakura, University of Tokyo*

Recently, the importance of public upstream engagement has been discussed both in public and policy discourses. This tendency is prominent around the emerging and converging technologies, such as nanotechnologies or genetic researches, which might have crucial impacts on human life and society. In Japan, upstream approach is also receiving attention, and several trials have been started to broaden public participation in the earlier stages of research and development (R&D). However, even if R&D is framed by upstream decisions, it does not always progress just along the frame. Focusing on the important but unpredictable role of decision making or adjustment behaviors of researchers and engineers in the R&D process, Fisher et al (2006) proposed to introduce the idea of "midstream modulation" to the model of science and technology governance. Midstream stages, that is R&D stages, are conceived as the important stages for influencing the technological trajectories more concretely than upstream and more flexibly than downstream stages, but practical strategies are still insufficient. We are developing the program to address ethical and social issues in a national research project for neuroscience in Japan. In this project, we conduct "Benchside Ethics Consultation (BEC)", ethics consultation for the researchers who engage in the R&D of Brain Machine Interface (BMI). BMI is one of emerging technologies in the field of neuro-engineering, which bridges human brain and external device, making a pathway to communicate directly and bidirectionally. In our preliminary trials, public related issues were observed through the consultations, and some specific structure which should be the key point for governance in R&D were identified, such as nested structure of the researches in the project and different ethics criteria of Institutional Review Boards (IRBs) between different research institutes (medical, engineering or information technologies). In this presentation, we discuss the potential of Benchside Ethics Consultation not only as a program to capture the ethical and social concerns in the midstream stages, but also as a tool for obtaining deeper information about the circumstances which researchers and engineers encounters. Programs like BEC might facilitate communication with researchers/engineers and the better understanding of ongoing R&D project for governance.

Chairs:

Steven Collins, University of Washington Bothell
Nozomi Mizushima, University of Tokyo

Discussants:

Sang Wook Yi, Hanyang University
Kohji Ishihara, The Universty of Tokyo
Kevin Chien-Chang Wu, Department of Social Medicine, National Taiwan University College of Medicine

046. Technologies of democracy (2): Expertise in Democracy

10:45 to 12:15 pm
5: 533

The session proposes to consider democracy as the outcome of processes that need to be studied in their own right. STS provides useful tools to study democracy as the product of heterogeneous technologies and experimental formats, made up of political theories, social science knowledge and methods and material arrangements. The phrase "Technologies of democracy" refers to devices used to produce citizens, public issues, ways of dealing with them, and sometimes democracy. Some of them, like voting systems, are well established - albeit occasionally controversial. Others - such as participatory mechanisms - are being developed to answer complex, controversial or elusive public issues. In any case, the relationship between technologies of democracy and the issues they are meant to deal with is not a given. Rather, the processes through which technologies of democracy are attached to particular issues, or can circulate from one issue to another need to be analyzed. Papers in this session consider one of the following items to analyze technologies of democracy: Technologies of democracy as experiments in democracy Experiments are a key site for the deployment of technologies of democracy, one where social scientists, policy experts and activists hope to demonstrate particular political outcomes (e.g. social laws that govern the behavior of citizens, the ability of lay people to intervene in scientific

activities, the feasibility of democratic forms of life). Analyzing technologies of democracy as experiments allows us to draw connections with the work of STS on experimentation in technoscience, and to pay special attention to the production of social scientific knowledge. Controversies about technologies of democracy Technologies of democracy might be resisted by the people expected to be involved in them, or become incompatible with the issue they are supposed to deal with, or with the collective they are expected to enunciate. Indeed, the ability of technologies of democracy to perform democracy is often contested, and this seems to apply in equal measure to conventional mechanisms like elections and more innovative devices such as experiments. For students of technologies of democracy, controversies are opportunities to render explicit the machinery of 'democratization'. Expertise on technologies of democracy Experts "of" democracy intervene in setting up technologies of democracy, and contribute to make technologies of democracy circulate in academic, economic and political spheres. Analyzing the production of expertise on technologies of democracy offers insights into the solidification of these devices, their integration into markets, and the epistemologies underpinning their operation. Relationships between technologies of democracy and political theories Technologies of democracy enact the political, and, as such, have been the subject of concern for political theorists. Following STS work on the links between economics and the practice of economy, one can investigate how technologies of democracy are shaped by and in turn shape political theories. Furthermore, studying technologies of democracy may also be a way of engaging with certain topics in political theory (e.g. the politics of problem-solving, the limits of popular sovereignty and post-territorial politics).

Participants:

Distributing Public Health: Domestic Technologies and Pilot Publics. *Ann Kelly, London School of Hygiene and Tropical Medicine*

In the fall of 2005, an entomologist, with the help of two locally-hired two carpenters, remodelled five-hundred houses in upcountry Gambia to demonstrate the impact of household screening on the incidence of malaria infection. Though the intervention spoke to common public health sense, generating evidence as to its effectiveness entailed elaborate spatial and social transformations. Even after narrowing the selection criteria to include only small mud houses with thatched roves, rural Gambian household architecture varies widely; thus, when installing screens, the field team had to widen doors with machetes or resize windows on the spot. The houses, moreover, are hardly made of durable stuff; over the three years of the trial, a number of masons were recruited to from the village to mend and resurface interiors as walls cracked and crumbled. This paper analyzes this experimental endeavour as an effort to democratize disease control through the introduction of a simple domestic technology. It begins by describing work required to create scientific equivalence between domestic spaces set against the backdrop of colonial experiments in development. It then considers the conditions of sitting the experiment in the Gambian household and the ways in which the project constructed the threshold between public and private and the limitations of the protocol in containing domestic habits. The paper concludes by reflecting on the publicity of the experiment and its efforts to expand evidence from Gambian into public health practice for 'the tropics'. For despite the experiment's success in reformatting house as experiment, the institutional character of the public of public health circumscribed the scalability of those claims. I argue that greater attention needs to paid to the conditions through which experimentation become 'representative' and gain democratic traction.

Deliberative technologies of democracy: understanding experts and expertise on public engagement in science and technology. *Jason Chilvers, University of East Anglia*

Given the varied involvement of some STS scholars and other social scientists in contributing to a participatory turn in the governance of science, and their longstanding commitments to understanding technoscientific expertise, it seems surprising that 'public engagement expertise' remains little studied. Yet it has become an established category of expertise in the science and society arena associated with the increasing institutionalisation, professionalisation, and commercialisation of participation and a burgeoning public engagement industry involved in the global production and circulation of social scientific knowledges, technologies, people and skills. This paper draws on recent research that builds on one of the first ever studies of experts on public participation in science and technology carried out by the author in 2001-2003. Both studies involved a range of actors from the UK public dialogue field in in-depth interviews coupled with network analysis to understand the nature of public engagement expertise, the roles and relations of these experts in participatory governance networks, and associated processes of professionalisation and learning. An enduring popular notion of a public participation expert is that of the 'mediator' or 'facilitator': intermediaries who organise technologies of participation at the boundaries between science, policy and society. Such expertise is characterised by 'technical' competencies (in social science theories, knowledges and methods for example) and claims to neutrality, but also emphasises learning by doing and is often highly situated in terms of the specific participatory technique (and embedded models of participation, democracy or the public), issue, institutional context, or ends to which directed. At the same time public participation expertise can be highly mobile, circulating, not unproblematically, from one issue or place to another - from issues of risk governance to innovation governance for example, as recently experienced in the UK. Traditional notions of public participation expertise are extending to also encompass roles associated with a wider diversity of actors that make up participatory governance networks - commissioners, critical social scientists, think thinks, institutions of participation, and so on. UK innovation in deliberative technologies of democracy has progressed along a rather narrow pathway, privileging heavily facilitated spaces of 'invited micro' public dialogue. Where this is problematised, constructions extend to include non-professional forms of public dialogue expertise associated with 'invited macro', citizen-led or 'uninvited' spaces of engagement. This is exposing tensions between the drive in the UK and many other western democracies to professionalise, commercialise and 'scale up' public participation expertise, amid growing concerns that this exacerbates the decontextualisation and homogenisation of public engagement and forces actors and institutions to lose sight of its underlying purposes and politics. This is compounded by the important finding that the ways in which UK science and policy institutions learn about and learn from public dialogue is instrumental only, thus crowding out potentials for reflective and relational forms of learning. Not only does this highlight the need for a comprehensive programme of critical social science research into technologies of democracy, it should also be constructive in making learning about these forms of expertise more situated and interactive.

No Nano ! No debate ! Nanotechnology and a contested technology of representation. *Brice Laurent, Ecole des Mines de Paris*

This paper focuses on political representation, and seeks to describe it as the outcome of (potentially contested) technologies made of materiality and theory. It considers the example of the French National Commission for Public Debate (CNDP), which was commissioned in 2009 by the French government to organize a national debate on nanotechnology. The debate was conducted from October 2009 to February 2010 and used a procedure that had been previously used by the Commission. The CNDP procedure seeks to ensure the representation of the arguments exchanged in controversial contexts, these « arguments » being supposed to associate publics and issues. I describe the technological features of the CNDP procedure, which are meant to ensure that a distance is maintained between the representational device and the arguments it seeks to represent. These features have been solidified through the work of various experts from administrative and social science circles. The nanotechnology

case was a trial for the replication of the already existing procedure. As a vast program of science policy and a range of practices that redefine scientific objectivity, nanotechnology proved to be complex to deal with. In addition, anti-nanotechnology activists intervened at multiple times during the debate. I describe the process of adjustment through which the activists work with the material arrangement of the procedure in order to articulate a critique that would not be represented as an argument among others, while the organizers had to modify the process to ensure that their representational distance was maintained. This example thus illustrates the amount of work needed to stabilize a technology of representation and isolate it from the issue it is meant to deal with.

Analysing Democratic Technologies: On the tension between social constructivism and democratic ideals in STS. *Alfred Moore, University College Cork*

The productive approach to democratic technologies raises interesting questions about the relationship between STS and political theory, two of which I aim to address in this paper. Firstly, in regard to STS's long-standing interest in the 'participatory turn' in scientific governance, this approach shifts attention from evaluation to articulation. Evaluation of the effectiveness of democratic technologies requires two things: a particular account of democratic values, such as degrees of participation (see Rowe and Frewer), that must be bracketed out of the analysis; and an assumption that the democratic technologies in question are relatively stable. The productive approach to democratic technologies, by contrast, regards them as rather messy and unstable 'technologies in the making' (Laurent 2009), whose emergence involves in complex ways the articulation of a range of democratic values and conceptions of the political. Secondly, I will suggest that this approach poses a challenge to the idea of a division of labour between constructivist analyses in STS and normative democratic theory. Hamlett (2003), for instance, argues for a special affinity between deliberative democracy and STS, whereby deliberative ideals provide normative guidance to social constructivist analyses. Yet the constructivist approach to democratic technologies destabilises some of the very notions of reasonableness, consensus, and impartiality that are central to normative models of deliberation. This provides further reason to be cautious about trying to evaluate democratic technologies against normative democratic ideals. This argument will be illustrated with reference to a foucaultian governmentality analysis of governmental bioethics (Braun, Moore et al. 2009). This approach, I will suggest, is well suited to showing the productive character of the democratic technology under discussion, and also at capturing the diverse range of problematizations that inform these practices. This analysis highlights the emergence of forms of knowledge that focus not on the scientific domain that is ostensibly to be controlled, but rather on the techniques of government themselves. Thus, we find the emergence of 'ethics as expertise', which is characterised by the aim of facilitating, mediating, stimulating and conducting ethical debate among various publics. The incitement to speak in a particular way about certain issues is itself informed by various accounts of deliberative democratic ideals. This paper will thus explore the ways in which analysing the constructive and productive character of democratic technologies can contribute to our understanding of the participatory turn in science governance.

Discussant:

Alan Irwin, Copenhagen Business School

047. Integration of STS regarding disease/biotechnology in Japan and Korea: Exploring representations

1:15 to 2:45 pm

12: 1212

This session focuses on varieties of representations of disease/biotechnology in East Asia based on the cases of Japan and Korea. The social discussions and contexts of disease/biotechnology contents are some of the most important themes in current society. In considering these topics, it is important to regard various aspects, such as communication between actors, context, and so on. To this end, many STS scholars have tried to analyze the various aspects of representations of disease/biotechnology. Currently in Asian countries, fresh STS research projects have emerged and spread rapidly. At the same time, investigations on discourses and images of disease/biotechnology have increased as Asian countries experience issues concerning disease/biotechnology that drive these social discussions. STS scholars in East Asian countries are gaining new insights. In our opinion, this is the time to integrate these insights. This process will contribute to both the discussion on the framework of "(Western) STS" and "East Asian STS." Thus, we would like to highlight the findings of the current research by four presenters from Japan and Korea. In our session, the first paper, by Sun Hee Yoon, describes BSE and risk controversy in Korea, comparing women's discourse about risk to men's discourse. It will be shown that women connect risk to their daily lives and represent risk with "everyday language," while men connect the matter of imported beef to the issue of the state and the whole community. The second paper, by Yeonwha Kim, provides insight into media images of the "Influenza A (H1N1)" in Korea in 2009. This paper focuses on the TV news and how it dealt with issues related the Flu and attempts to explain why Koreans showed strong fears for Influenza A, even as the TV news had covered various aspects of it. The third paper, reported by Mikihito Tanaka, focuses on a prominent Japanese movement concerning swine flu (H1N1): the public use of masks. This paper will provide insight on the status of communication between medical experts and non-experts, the active use of masks by the Japanese public as a precautionary measure, and the timeline for changing dominant frame of discourse on H1N1 through a variety of research. The final paper, by Jin Higashijima, describes the present relationship between the science of Autism Spectrum Disorders (ASD) and society in Japan, and provides insight into the social and ethical issues on Autism Spectrum Disorders (ASD) that have emerged in present-day Japan, in order to consider the complex situations experienced by people with ASD and their relatives. This session will provide meaningful and provocative discussion on current issues regarding disease/biotechnology through the introduction of exciting case studies in East Asia. And at the same time, this will also offer new perspectives that will contribute to discussions on "STS in Global Contexts."

Participants:

Women's Language and Risk Perceptions: BSE and Risk Controversy in Korea. *Sun Hee Yoon, Interdisciplinary Program in History and Philosophy of Science, Seoul National University*

This paper aims to search how the BSE risk was perceived by Korean women in 2008. On April 18, 2008, a Korea-USA agreement which contained the import of all type of U.S. beef was signed, and many citizens who opposed the agreement participated in the candlelight vigil. They insisted that since U.S. beef is not safe to eat due to its BSE risk, the Korean government should not import it. However, the Korean government claimed that U.S. beef is safe, which provoked a series of heated between the government and citizens. In those days, the citizens exchanged information of BSE through the internet. And the majority of them who perceived and communicated the risk of U.S. beef on the internet and put it into action were women. Women posted articles on the risk of BSE on internet communities actively and were eager to participate in the candlelight vigil to diminish the risk. Especially on May 3, teenage girls leaded the vigil. It's a very special event that women spearhead a vigil or a demonstration in Korea. What makes women take actions? To answer this question, this paper compares women's language about risk with men's, and shows the difference in risk perception between women and men by analyzing three Internet communities of women and one Internet community of men. This paper shows that women perceived the risk of BSE more subjectively, and thus more dangerously, than men. On the other hand, men took risk as a numerical value or probability. This paper also shows that whereas women regarded the risk of BSE as an individual and familial issue, men tended to consider the risk to be a matter of the whole community. That is, women linked the risk to their daily lives and represented the risk by using 'everyday language'. This differs from men's language which perceived the risk as the issue of the state and the whole

community.

Exploring Images, Exposing Fears: Media Representation of the Flu Pandemic 2009 in Korea. *Yeonwha Kim, Interdisciplinary Program in History and Philosophy of Science, Seoul National University*

The Year 2009 was remembered of the worldwide threat of Influenza A (Swine Flu). It started from massive deaths in Mexico on April. Swine was suspected for the origin of Flu, which is the reason for naming it Swine Flu. The Korean government tightened quarantine inspections for humans and pork coming from the United States and Mexico. However, it soon became the fact that the virus is transmitted from persons to persons. On the 1st of May, WHO confirmed to name "Influenza A (H1N1)," which was translated to "Sinjong-Flu (New Kind of Influenza)" in Korean. The number of confirmed patients rose rapidly for a short time. WHO declared the Pandemic for the state of Influenza A on the 12th of July. On August one patient died from pneumonia caused by Influenza A, which was the first death report. The Korean government set central-point hospitals to care for influenza A; however, it was reported that patients could contaminate hospitals. After the summer vacation, several schools took a rest for several days to protect students from Flu and the Ministry of Defense banned vacations for military servicemen. While the deaths by Influenza A increased, famous Korean actor's only son died from Influenza A which was a big issue on media. The Korean government also took an action for cure and raised the level for Flu to the highest. Vaccination started from medical personnel and spread to public. Since the start of Influenza A, concerns about it had been expressed from various fields. The majority of those concerns were on its contagious abilities and economic crisis, farmer's worry about falling prices of pork, and probable-variant of virus. While people took Tamiflu for cure, some concerned about its side effect. Before starting vaccination, there were worries that vaccine had bee gone through enough processes to prove its safety. As soon as the first news about Influenza A was on aired on the 25th of April and the media continuously reported on it up to December in 2009. This paper focused on the TV news how they dealt with issues related Flu. Influenza A took a space for a long time on TV news with lots of headlines. On the one hand, especially from late April to May, the media intensively reported what was happening in international areas, what Influenza A was, and how the government managed to eradicate Flu. Considerable portions of news broadcast from mid August to mid November, on the other hand, delivered scientific information about the virus, cure and vaccine and sometimes suspicions about acts of various organizations. This paper, exploring images on Influenza A shown through Korean TV news in Korea, attempts to explain why Koreans showed strong fears for Influenza A although TV news had covered with various aspects of it.

"The Mask Capriccio" over the swine flu in Japan. *Mikihito Tanaka, Graduate School of Journalism, Waseda University*

The outbreak of the new flu caused by "pandemic H1N1/09 virus (H1N1)" began in the Mexico, and rapidly became a global issue. This new flu, called "swine flu" at the first stage of the pandemic, enlivened the media as both a public health and social issue. In Japan, the first domestic patient was confirmed in Kobe city, followed by cases in Kawasaki and Fukuoka. During this period, the Japanese society showed a peculiar reaction - most of the citizens wore masks. Almost everyday, the media reported a picture with masked citizens. At one time, retailers exhausted their stocks of masks, and medical institutions had difficulty getting masks. Importantly, scientific characteristics of H1N1 were unknown at the beginning of media coverage. In this H1N1 case, the outbreak, provision of scientific knowledge by specialists, and its risk reporting occurred simultaneously. In this presentation, we will report about this hot topic from various points of view, mainly focusing on "the mask capriccio" phenomenon as described above. The contents and methods we investigated are as follows: (1) How did the media report? - Media frame analysis during "swine flu" period in domestic newspapers. (2) What happened during the information production? - An analysis of the interviews with medical workers, researchers and journalists who were involved in the event. (3) How did the public react? - An analysis of web questionnaires from the citizens in 3 cities (n=2400). And (4) What did the lay people talk about in the public sphere? - Weblog analysis of the word "mask" and "flu". Results showed outlines of this event. According to the media frame analysis of newspapers, the usage of masks as the new flu symbol originated from the ministry of health's advice in accordance with the precursory principle, and the media autocatalytically amplified this attractive symbol. As time passed, the article itself rapidly improved into more evidence-based tones, but the mask still had remained as the symbol of H1N1. Interviews with the actors in this media event showed that miscommunication between specialists and journalists rarely occurred in this case. H1N1 was a new infection, but the actors had chances to rehearse during past events such as SARS or Avian flu. Therefore they knew how they should talk or whom they should ask, and how to control rumors. Also, the analysis of web questionnaires showed that lay people did not wear masks merely because of the panic, but decided to independently, according to their lay logic - some wore masks as a public manner, forced by the local community, or some chose to wear masks allowing to the precursory principle. Discourses on weblog showed an interesting pattern. During the small events related to H1N1, lay people first noticed the event as the disaster, but soon they tried to gather scientific evidence and after then they worried about their own health and lay society. These results showed that the science communication during H1N1 pandemic generally worked well, but the agenda building process of the media needs further reflection.

Scientific advancement and society: the autism spectrum disorders' case in Japan. *Jin Higashijima, Graduate School of Biostudies, Kyoto University*

Autism Spectrum Disorders (ASD) is a group of neurodevelopmental disorders with considerably high genetic contribution. As ASD is diagnosed by observation of core behavioral symptoms, the definition of ASD has undergone various changes over the past decades. The changes have deeply affected people with "so-called" ASD and their families all over the world. Recently, the prevalence of ASD reached almost one in 100, having increased dramatically. In addition to the changes in ASD definition, there are at least three factors that expected to affect people with ASD and their families. First, changes in the social framework in which people with ASD and their relatives are treated have been deeply affected. Law is a good example of this. Second, increasing social, particularly educational and medical, awareness of ASD is concerned. Well-established medical definitions, DSM-Ⅳ and ICD-10, are now prevalent in Japan. Third, the body of scientific knowledge about ASD produced by medical science, neuroscience and life science are increasingly to be regarded. Considering the aforementioned situations, this paper aims to (1) describe the present relationship between the science of ASD and society in Japan, and (2) point out several concerns in Japanese situation. My main focus is on the complex situations experienced by people with ASD and their relatives. First, I would like to clarify the characteristics of growing ASD representations among parents of children with ASD, based on semi-structured interviews, which were conducted with more than 50 parents with child/children with ASD. The impact of the embedded Japanese social system on our respondents was suggested. Then, regarding the related scientific and social situations, I will try to illustrate several important social and ethical issues that have emerged in the present Japanese situation. Urgent countermeasures are necessary, though who should handle the situation remains unclear.

Chair:

Jin Higashijima, Graduate School of Biostudies, Kyoto University

Discussant:

Makoto Hayashi, Faculty of Engineering, Kogakuin University

Non-Presenting Authors:

Makie Yamashita, Graduate School of Journalism, Waseda University

Masanori Watanabe, Graduate School of Journalism, Waseda University

Kaori Ohishi, Graduate School of Journalism, Waseda University

Shiro Segawa, Graduate School of Journalism, Waseda University

048. Expertise and Environments

1:15 to 2:45 pm

12: 1213

Participants:

Reluctant Expertise: Reflections on knowledge and practice in environmental policy making. *Kevin Edson Jones, University of Alberta*; *Alan Irwin, Copenhagen Business School*

ABSTRACT: 4S TOKYO Reluctant Expertise: Reflections on knowledge and practice in environmental policy making Authors: Kevin E. Jones and Alan Irwin The relationship between STS and policy making has been a notable and enduring feature of the discipline. Important challenges have been made to technocratic models of governance, exposing uncertainty and the socio-political relations inherent in government decision-making and regulation to critical scrutiny. Policy areas, such as the environment and health care, continue to depend upon expert scientific knowledge as they seek to cope with complex and enigmatic policy problems. Evidence-based policy making remains a central aspiration of western governments. Understanding the relationship between science and policy thus remains pertinent, as do the epistemological and democratic challenges which have characterised the relationship between STS and public policy. However, where in the past STS may be have been perceived as a small, although still significant, voice of critical impetus, today the discipline is deeply engaged with governing science. No longer on the outside, STS scholars and their students find themselves active participants in seeking, not only to understand, but also to better scientific governance. Alongside their roles as researchers, authors and teachers, STS academics are taking on roles as expert advisors, committee members and even seconded policy officials transgressing traditional boundaries between research and practice. Drawing on personal reflections and experiences of participation in the policy sphere this paper explores the relationship between STS scholarship and environmental governance. In doing so, it draws upon the conversations evolving out of a 2004 Workshop in Oxford which asked the question; "Does STS Mean Business?" Then the challenge to participants was to address the implications of a focus on utility and practical consequences for the development of STS. Moreover questions were asked about whether the expertise provided by STS could be perceived as 'good value' in applied contexts. We pick up this conversation by reflecting upon what has been achieved by STS in furthering UK environmental governance. Firstly, we address the suitability of epistemological relativism as an expert backdrop to developing effective policy development. For instance, we ask if reifying relativism through a preoccupation with opening up scientific advice and policy processes can detract from the need to close down policy issues and make pressing decisions. Secondly, beyond assisting governments to develop a reflexive capacity in the application of science to policy, what expertise can STS provide to developing practices which contend with uncertainty, make choices between contested knowledges and balance the evidence-base against wider political concern? Finally, as STS research becomes part of the evidence-base guiding policy development, and epistemological relativism potentially becomes reified in policy processes, we enquire into the need for a reflexive ethics in STS.

The Autonomous Role of Science in Environmental Movements. *Yuji Tateishi, Kwansei Gakuin University*

This paper explores the autonomous role of science with particular focus on scientists and social movements in environmental issues. In environmental issues caused by large-scale developments, it is difficult for environmental movements to establish and utilize a network of scientists who can provide the movement with a scientific basis, due to a strong connection between government officials promoting large-scale developments, scientists, and engineers. In some cases, however, environmental scientists keep a distance from the connection and carry out academic research autonomously, which enables environmental movements to assess the validity of a development project from outside. The earlier literature in STS (e.g., Yearley) found the ambivalent relationship between science and social movements, but ignored the autonomous role of science in the complex of science, technology and society. This paper distinguishes between two roles of scientists in environmental movements. The first is the role of discipline-driven researchers, who limit their activities to their area of expertise and try to produce scientific knowledge to support the movement's claims. The second is the role of concern-driven researchers, who limit their activities to the domain of public concern and gather a wide range of knowledge, whether academic or not, beyond their own discipline. The concepts of discipline-driven and concern-driven researchers might correspond to "contributory expertise" and "interactional expertise" by Collins and Evans, respectively. Paying attention to the distinction between the two roles, this paper deals with the case of the Nagara River Estuary Barrage in Japan. The barrage was built at the mouth of the Nagara River in 1995 for the purpose of flood control and water supply. We can divide the issue into two phases, before and after 1988, the year when construction began on the barrage after prolonged conflicts among the government, local anglers, and environmental movements. Based on a document analysis of historical materials and in-depth interviews with the people involved in the barrage issue, we found a drastic change in the relationship between scientists and social movements. In the first phase of the issue, citizen movements lacked a connection with discipline-driven researchers, and the only thing they could do in scientific disputes was to find flaws in the government's argument with the help of a few concern-driven researchers. The conflict converged on whether decisions should be made in a technocratic manner or in a democratic manner. In the second phase, the network of scientists and environmental movements developed widely to include both concern-driven and discipline-driven researchers. Scientific arguments in favor and against the barrage project confronted each other. The main factors in this development were related to the autonomy of science. Conservation ecology developed through the accumulation of experience of environmental impact assessments and separated itself from the complex of river engineering. The conservation of the ecosystem became a goal of environmental protection. The distance between academic research and the concerns of environmental movements decreased, with the result that the movements gathered discipline-driven researchers and set up a committee that functioned as a scientific arena.

Wind Turbine Encounters. Scientists speaking for birds and biodiversity. *Ingrid Øverås, Norwegian University of Science and Technology*

When exploring wind power as a sociotechnical system, we encounter a variety of controversies because there are many different topics that may be made into objects of disagreement. Biodiversity is a central issue in this respect. For example, in Norway, birds - through their spokespersons - have the potential to become relevant actors in such controversies, as we have seen in several recent wind power development projects (Solli 2010). Ornithologists and other biologists preoccupied with biodiversity warn us that as wind turbines are installed, birds may suffer negative consequences. In particular, there is concern that wind turbines kill many birds. The paper explores how the birds'

spokespersons, the biologists, deal with this issue. How do they proceed methodologically to describe the potential relationship between birds and wind turbines? What research strategy do they employ? What are their aims? I scrutinize such questions to get a grip on their knowledge production. The analysis is primarily based on semi-structured interviews with biologists at Norway's leading institution for applied ecological research. The paper studies the strategies these scientists use to gain scientific authority, exploring potential conflicts with respect to research methods and the possibility of the scientists to be able to actually be spokespersons for the birds in relation to wind power turbines. How do the members of this epistemic community "attach" authoritative knowledge "to nature" (cf. Kuhn 1970)? And how do they interact and communicate with wind power engineers and other actors in wind power developments? The paper adds to the discussion of how STS might contribute to the understanding of technoscientific controversies but also provides insights into the features of scientific production of knowledge and scientific communication with respect to birds and biodiversity.

049. Social Implications of Science and Technology in Present-day Japan: Politics, Industry, Labor, Gender, and Culture

1:15 to 2:45 pm

12: 1214

Despite the collapse of "the Bubble Economy" and the subsequent deep recession in the early 1990s, Japan's annual expenditure for science and technology steadily increased to 200 billion dollars in 2009. The figure is about 3.5% of the GDP, the highest ratio in OECD countries. This big spending has brought the Japanese society several important results, among which are the rise of high-capacity digital networks and competitive high-technology manufacturing. Furthermore, in the 1990s, "the Science and Technology Basic Act" and "the Basic Law for a Gender-Equal Society" were passed by the National Diet. They were expected to promote Japan toward a more innovative and equitable society. However, Japan is still facing many difficulties: an almost zero-growth economy, a high unemployment ratio, an increasing gap between the rich and the poor, the fall of the rural community, and a decrease in medical and welfare services. The situation of the growing number of highly skilled workers in the knowledge-intensive service sector (KIS) is another important issue. The lack of an allocation policy of the educated work force is producing a large number of "working poor having an academic background." This session intends to open the way to overcoming these problems with four presentations regarding studies of science, technology, and society in present-day Japan. First, the administrative performance of the government in science and technology, one of the crucial issues regarding this problem, is analyzed in the context of Japan's science and technology policy since the 1990s. As a representative case, the national energy policy is discussed. The conversion of the economic structure and its outcome and the rapid expansion of ICT and KIS are treated as the next important issue. The ongoing segmentation of the consumer market might be an obstacle against the repercussion of technological innovation. The allocation of skilled workers, who are competitive in science and technology, is also significant. In the changing economy, new features have emerged in the manner in which science/technology-related occupations are managed: temporality, flexibility, and specialty. Gender issues are essential to understand the nature of employment practices and the quality of working life. These problems are investigated in the third presentation. An outcome of ICT development is the serious decline of the publishing business of paper media, which has been a critical infrastructure of every cultural activity, including academia. The fourth presentation investigates the recent trend of this business. It also analyzes the changing social function of editorship. Speakers have been working on an ongoing project, "the Social History of Science and Technology in Contemporary Japan," since the 1980s. Several books have already been published. One of the needs of STS is to analyze this complex relationship and the actual performance of both 'science and technology' and 'society' in the real world, present-day Japan, in this session.

Participants:

The Structure of a New Techno-scientific Nationalism in Japan. *Hitoshi Yoshioka, Professor of Kyusyu University*

In the first half of 1980s, several Government Councils on science and technology policy in Japan presented a brilliant vision of techno-scientific nationalism. At that time, many Japanese leaders of science and technology confidently predicted that the Japanese techno-science would be a front-runner in every field, including military high technology, in the near future. Influenced by the spreading myth of "Japan as No.1 ", the techno-scientific overconfidence in Japan reached its peak. The vision was faded away in the early 1990s with the collapse of "the Bubble Economy" and subsequent deep recession. In the mid-1990s, the political leaders of Japan adopted the neo-liberal structural reform policy. It was promoted under the strong leadership of National Government to revitalize the Japanese economy and industry. At the same time, the political leaders also promoted the polity to strengthen quasi-socialistic control of many crucial sections closely related to economic and industrial recovery, including science and technology, by the National Government. In short, the neo-liberal structural reform was one of the elements of the national strategy for economic and industrial recovery. In many crucial fields, medium-range national plans and long-term national programs have been drawn up. The Council of Science and Technology Policy (CSTP) of the Cabinet Office have been established in 2001, and the Science and Technology Basic Plan have been revised every five years. The "survival of the state by creative science and technology" has been the official catchword of the Japanese government since then. The techno-scientific nationalism had revived after the 10 years of interruption. One of the crucial differences between the old version and the new is the degree of the self-confidence. Although the neo-liberal structural reform has its own driving force, its influence would be restricted by other elements of the national strategy. We would give a precise analysis of the case of nuclear industry, where the strong political commitment based on a national security guideline, and a strong government-industrial complex (the " Tetrahedral Structure of Nuclear Industry") exist. The neo-liberal structural reform for liberalization of electricity market has been effectively blocked.

Industrial Technology in Present-day Japan: Innovation, Market, and Labor Kunio Goto, GKnet NPO. *Kunio Goto, GKnet NPO*

Since the collapse of the "Bubble Economy" in early 1990s, the Japanese economy has been in a deep recession, and experienced serious deflation. However, significant investments in science and technology have continued, and even in a zero-growth economy, Japan has experienced remarkable changes in industrial technology. Thus, Japan could establish a competitive high-technology-based manufacturing, which might have supported economic recovery, at least in a few years before the financial crisis of 2008. The sophisticated products, such as hybrid automobiles, digital electro-mechanical devices, and advanced medical equipment prevailed the market. They depend heavily on access to parts and raw materials listed below: (1) High-quality raw materials: steel plate for car bodies, titanium alloys, carbon fiber, organic thin membranes, 12-inch silicon wafers, and functional ceramics; (2) Sophisticated parts: semiconductor chips, passive elements, connectors, photo-electronic devices, mini-motors, and combined programmable parts; (3) High-tech capital goods: high-precision machine tools, high-capacity test machines, and the architecture of high-tech manufacturing plants. In order to supply these materials and parts, manufacturing firms and systems must have next features. (1) Systems are generally integral and not modular. Therefore, multi-talented and highly skilled workers are necessary in manufacturing plants. (2) The production of raw materials requires significant capital investments and a highly skilled workforce. (3) Innovative small firms often play a significant role in the manufacture of parts. The above-mentioned manufacturing helped improve the economic performance of Japan. The coming knowledge-intensive economy will be supported by them. But, the sustainability of high-tech industry under the current circumstances is questionable. Markets and labor are essential elements for any economy. Japan is no exception in that its high-tech manufacturing depends on markets and labor. The current worldwide financial crisis is characterized by a dichotomy of rich

and poor. Recessions tend to diminish the strength of demand. In other words, the production of high-quality, expensive, and highly profitable goods should decreases. On the other hand, the outcome of the expansion of a market for the poor might be further deflation. In any case, the domestic industry is expected to decline. Assurance of enough skilled labor is another critical aspect of sustainable high-tech industry. The opportunities for skill improvement also diminish when labor costs diminish under a recession. Thus, market and labor are decisive factors in connecting science/technology and industry. The author will clarify the situation by analyzing the Japanese industry of the present-day.

Working Practices in S & T-Related Professionals and Gender Issues. *Motoko Kuwahara, Gakujutsu-Kenkyu Network Director*

In societies with access to well developed digital networks, greater numbers of highly skilled individuals are working in the information and communication technology (ICT) industries and knowledge intensive service (KIS) sector. The workers should have a new job style with autonomy, flexibility and flat hierarchy. Moreover, these individuals are required to increase their capability in order to be competitive in the global economy. This working style had been an ideal for scientists, especially Japanese theoretical physicists in the mid-Twentieth Century, and they realized a comfortable working life and high achievement. On the other hand, the above-mentioned working style sometimes brings reduced job security. In present-day Japan, the latter situation is predominantly increasing. An object of this paper is to explore the reasons for such a situation to take place. Nowadays, non-tenured temporary positions have increased at many institutes and universities. This situation has brought lack of job security and insufficient funding for research to many young scientists, because the socioeconomic condition about young scholars has changed during the last half-Century. On the other hand, for young female scientists, the situation has always been difficult. Therefore, for the object in this paper it is useful to analyze the situation of female scientists in the last half Century. In the 1950s-60s, Japan was going into a heavy-industry based society, and the economic growth has brought scientists to an enlarging pie, for example, increasing employment. But, the same socioeconomic situation has brought the professional-class women to a negative action, because social policy established at that time was based on male breadwinner model. This gender regime of heavy industrial society has continued to bear the twofold burdens to workingwomen. Since the late 1990s, Japan has been facing two problems: an aging population and a zero-growth economy. On surroundings of women the situation has largely changed. In 1999, the Basic Law for a Gender-Equal Society was established. In 2005, the Second Basic Plan for Gender Equality described "women in science and technology" as one of the policy agenda. It was the first case of this important issue. In 2006, the Third Basic Plan for Science and Technology decided a quantitative target on number of women scientists. Nevertheless, in the last decade, the share of women in researchers has not so much increased: from 10% to 13%. There might be the same reason that brought young male scholars and professionals to unstable situation in both work and life. That is, Japanese social system is not suitable to economic system. A new social policy, which is suitable for a digital, knowledge-intensive society, is needed in Japan. Analysis of the present situation and exploration of a feasible policy are given in studies in "science/technology and society".

Changes in the Publishing Business as a Result of ICT in Japan: Amateurs Are Expelling Professionals Junko Hariya. *Junko Hariya, Hensyukoubou Kyuu Inc. COE*

The traditional publishing business is being drastically transformed as a result of advances in the field of Information and Communication Technology (ICT). In the publishing business, book production is the area most significantly influenced by these changes. This is a critical issue of our time, because books have been the platform of every intellectual activity. The author has engaged in publishing more than 300 books as an editor. Based on her experience, the major changes in publishing since the 1980s are reported. The impact of ICT on the publishing business can be separated into two phases. First, the emergence of ICT produced changes in the book editing process starting in the mid-1980s. Progress of word-processing software permitted a large number of people to improve their writing and editing skills and become potential writers. Before the advent of electronic publishing, vanity presses were expensive; however, now, individuals may publish their work at little cost. In this way, regarding book production, the distinction between professional and amateur writers has become blurred. The second important change took place in the mid-1990s. At this time, ICT became available to the administrators of the publishing business. Thus, market research, as it relates to book sales, became more sophisticated. This led to a radical change in the attitudes of publishers. The sales and marketing divisions suddenly achieved more authority and power than the editorial staff. Moreover, the current development of the e-book business might have further effects on the role of editors, who, up to now, had been significantly influential in modern cultural activity, including academia. STS deals with the relationship between the publishing business and ICT, one of the major achievements of science and technology.

Discussant:
hironori ayabe, Waseda university

050. Traveling Comparisons 1: Translation in Technology Transfer

1:15 to 2:45 pm
12: 1222

This series of three interlinked sessions will investigate emergent circumstances in which scientific and technological practices intersect with anthropological interest in cultural, regional, and natural differences. Specifically, these sessions focus on the ways in which knowledge, artifacts, and living things travel through the globalization of science and technology. While various methods of comparison have always been part of the anthropological enterprise, such comparative work is at the same time part and parcel of the very practices that are being studied. From experimentation to statistical analysis, comparison connects pieces of information to produce knowledge. The work of comparison is thus always central to science and technology practices. Moreover, in today's globalizing world, such comparative practices also resonate with ethnographic interest in the diversity of social life through the global circulation of facts, artifacts and people. Along with a growing interest in development outside of the West, a wide range of comparative practices in science and technology - from engineers' own reflections on cultural differences in global engineering, to genetic research focusing on "ethnic" differences - has captured fresh interest from STS scholars. However, there is more to it than the politics of epistemology. Practical ontology advocated by actor-network theory (ANT) is particularly significant here because it opens a new dimension of reflection about comparison: it allows us to consider ontological questions raised by the travel of objects. As ANT demonstrated that scientific facts and technical artifacts dwell in relationship with other objects, the travel of science and technology to developing regions is of particular interest to STS scholars because it has the potential to destabilize or transform facts and artifacts by cutting them from their original relations. This means not only that scientific facts and technical artifacts are not the same in different places, but also that modes of ontology or "topologies" are altered when objects move from one place to another. Thus, a new question arises: how do the dynamics of a relational ontology of travelling facts and artifacts stimulate, implicate, and intermingle with works of comparison that themselves relate different objects, people and places in knowledge practices? How can ethnographers, whose implicit or explicit comparative methodologies are always already part of the practices they study, describe these intricate relationships? As the first of the combined sessions, this session focuses on technology transfer, one of the oldest topics in East Asian STS. We will explore the relationship between multiple ontologies of facts and artifacts and comparative knowledge practices by focusing on two different aspects of translation inherent in technology transfer. On the one hand, as the ordinary sense of the word indicates, technology transfer raises the classical

anthropological problem of how to transfer concepts and practices from one context to another. On the other hand, transfer also involves translation in the ANT sense of enrolling the divergent interests of human and non-human actors in order to make up new, stable networks. We will explore how ontological dynamics and knowledge practices are mutually implicated by focusing on the interplay of these two translations.

Participants:

Out of Context, Searching for Context: Translation and the Fluidization of Agricultural Machinery in Thailand. *Atsuro Morita, Osaka University*

The relational ontology of actor network theory (ANT) has raised the question of how technical artifacts are transformed as they travel to the developing world, where they are cut off from the physical, social and conceptual relations that had previously stabilized their forms and functions. How do such transformations reveal the ontological multiplicity of science and technology? The development of agricultural machinery in Thailand offers new insights into this ontological question. In Thailand, small local factories manufacture a large share of farm equipment. These factories have formed their own technology largely by adjusting imported machines to the local agricultural environment. This presentation discusses the transformation and fluidization of farm equipment in Thailand by focusing on how the process of redesign generates intricate relations between mechanics, machines, and other elements in the Thai agricultural context. I discuss these heterogeneous relationships by drawing on Marilyn Strathern's argument on the interrelation between connecting and implicated relations. In the course of developing a machine, mechanics at local factories remodel imported equipment in an attempt to build stable relations between the local environment and the machine's design. For instance, mechanics used successive test runs and remodeling to gradually adapt a combine harvester to conform to fibers from the local paddy, the structure of the field, and the size and form of the local grain. In this aspect, machine design connects independent entities, including the machine itself and elements in its surrounding environment. However, in this process, mechanics see not only the elements in their local environment, but also the foreign context that is implicated in the original design of the machine. Since the original design reflects the foreign environment in which the machine was designed to fit, the two environments arise as a figure-ground relation in the mechanics' skilled vision, through which they frame the technical problem of adapting foreign machinery for local use. However, this comparative practice has generated a widely different topology of conceptual relations that is mostly incompatible with the dominant topology in the developed world. That is, machines that have traveled to Thailand are detached from their original conceptual relationships. This detachment includes intellectual property (IP) rights, which connect a machine's specific design with its "author" by means of excluding the numerous people who potentially contributed to the innovation. The relative lack of IP law enforcement in Thailand thus leads to a state of affairs in which machines are viewed as the objectification of a web of collaborative relations among heterogeneous people who were visibly involved in an innovation. As a result, Thai mechanics do not see the design of machines as the outcome of a specific individual's genius; rather, they see machine design as a sort of commons to which no one individual has exclusive rights. By focusing on the mutual constitution of the connecting and implicated relations surrounding machines in Thailand, this presentation explores the interrelation between the comparative practices and the incompatible ontologies that are both generated by the travel of machines to the global south.

Growth of Visions and Technicalities in Urban Infrastructure Development: The Design of a Bus Interchange in Vietnam. *Hirotsugu Terado, University of Tokyo*

While the term 'technology and knowledge transfer' abounds in development cooperation, it is often hard to specify what is transferred even within a single project. For what is transferred could be (and is) described at different material and conceptual scales and as part of different domains, not only by academic observers but by the practitioners who engage in knowledge transfer practices, themselves. It might be argued that in the course of the projects, the very artifacts or ideas to be transferred are constantly constructed and changing in ways that facilitate subsequent actions: translations at work in transfer. In such processes, we should pay attention to the institutional contexts of the projects as both constraints and resources for the practitioners to construct those translations. As an attempt to explore knowledge practices in relation to such institutional dynamics, I explore how visions and technicalities emerged and were contested in the case of one urban public facility, a bus interchange, in a development cooperation project in a Vietnamese city. The bus interchange was envisioned by a foreign expert as a measure to ensure efficient and comfortable transfers between lines, based on similar examples in Europe and on his diagnoses of the city's existing public transport system. The design work from this initial concept, both abstract and concrete, not only produced a material image and the technicalities for the interchange and its surrounding areas, but also turned it into a much more strategic facility for future urban public transport than had been envisaged at the beginning. I understand this process as the growth of the vision of the project. It was contingent upon the existing conditions of the location and other transport development projects in their early planning phase. However, at the moment when construction was supposed to begin, the design was challenged by the Vietnamese authority resulting in large modifications to it. While both the challenges and the responses by the project were expressed in terms of technicalities, the conceptual implications of these technicalities varied between the two. Furthermore, technical arguments themselves had performative institutional implications. In this presentation, I will mainly analyze discursive practices used in this situation for elucidating knowledge practices between multiple scales and domains and for getting insights into how translations work in technology and knowledge transfer.

Translating the Order for Compact City: Technology Transfer in the Study for the City Master Plan of Ulaanbaatar City, Mongolia. *Yu Nishigaki, Osaka University*

In this presentation, I offer a case study of a technology transfer from Japan to Mongolia to improve the capacity for city planning through "The study on city master plan and urban development program of Ulaanbaatar City (UBMPS)," by the JICA (Japanese International Cooperation Agency) study team. I especially focus on the pilot project to improve the living conditions in "ger areas (a ger is a traditional Mongolian tent)." In doing so, I aim to examine how the Japanese planners found and aimed to organize local orders to implement their plan, especially the "compact city model" and the "community-driven mechanism" in ger areas through a pilot project with their Mongolian counterparts. I aim to make clear the multifold comparison or translation process in the technology transfer through the study for future city planning Since the end of the 20th century, the population of Ulaanbaatar city has increased rapidly as a result of urban migration. Most of the newcomers from the countryside have settled in "ger areas" in the peripheral area of Ulaanbaatar. The population of the ger areas accounts for about 60 % of the population of Ulaanbaatar City. Air pollution caused by smoke from ger chimneys has become a major urban problem in Ulaanbaatar. One major aim of the urban planning for Ulaanbaatar City approved by the Mongolian government in 2002 is to replace ger areas with apartment areas. But in 2003, the land privatization policy was implemented targeting residential sites in ger areas, which put a stop to this plan.   In 2007, a JICA study team was organized to improve this situation at the request of the Mongolian government. The objectives of the study were 1) to revise the current master plan, 2) to prepare an action plan, and 3) to transfer technology to improve the capacity for city panning. As a result, the study team proposed the compact city model to control urban sprawl in ger areas and formulated the "Neighborhood area development plan" through community-

driven mechanisms especially in the pilot project for the improvement of the living conditions in ger areas. I discuss how the Japanese planners translated their framework of the compact city or "Neighborhood area development plan" into the order of the dwellings of the residents in ger areas. And I aim to point out that these translations by Japanese planners did not work alone, rather they worked with some previous translations implemented by international organizations, the government, NGOs, and the local residents correlatively, especially in the land privatization process and the urban development practices under the conditions of the post-socialist transformation. Through these divergent and correlated processes, the local residential units called "hashaa" in ger areas mediated translations and comparisons among the land privatization policy, the urban development projects, and the study for the city master plan by the JICA study team.

Travelling with the Disease Self-Management Program: Connections and Comparisons in Globalized Health Care. *Annegrete Juul Nielsen, Department of Organization, Copenhagen Business School*

This paper addresses the question of travelling technologies - the connections they build and the comparisons they facilitate - through an ethnographic study of a social technology - a Disease Self Management Program for patients with chronic conditions. The Disease Self Management Program was developed at Stanford University and has since then been adopted globally in diverse places such as Taiwan, Scandinavia, UK and Australia. Building on a very rigid structure and manuscript the program is designed to increase the patient's capacity to self manage treatment, symptoms and life with chronic illness at large. While the program was developed locally (at an elite American university) and has since been disseminated and translated in a variety of other localized practices, this process also suggests an emerging global agenda within health care that aims to mobilize and engage the patient's own resource in care and treatment. Studying the adoption and adaptation of the Disease Self Management Program in a Danish setting offers opportunities to reflect on how travelling technologies build new connections between ideas and elements located in different times and places. As well, it facilitates analysis of how these connections enable previously unregistered differences to become visible and thus comparable. Notable among these is that the enactment in a Danish setting of the Disease Management Program creates connections between American and Danish conceptualizations of patienthood and health care. These connections generate new forms of difference and similarity, for example, in terms of what is entailed by being a patient. In turn, they enable comparisons which link people, things and facts in a variety of unexpected ways.

Chair:

Atsuro Morita, Osaka University

Discussant:

Marianne De Laet, Harvey Mudd College

051. Sustainable Development beyond Boundaries

1:15 to 2:45 pm

13: 1312

Participants:

History and Philosophy of UN Debates on Science and Technology for Sustainable Development. *Esha Shah, University of Sussex*

In this paper, I revisit a series of key moments in the last 50 years of UN debates on science and technology for sustainable development. The paper is a historical reflection on the way in which notions of development in the UN debates since the WW II have been associated with science and technology. The paper especially looks into the UN debates in the 1960s and 1970s which were declared as development decades. Two major conferences on science, technology and development were organised during this period: The first UN Conference for the Application of Science and Technology for the Benefit of Less Developed Areas (UNCSAT) was held in Geneva in 1963 whereas the second conference on Science and Technology for Development took place in Vienna in 1979. The paper discusses some of the fundamental philosophical assumptions on science and technology for development employed in organisation and outcome of these conferences and reviews the direction in which these assumptions and corresponding practices in the UN changed over the course of the development decades. The paper subsequently engages with way in which the notion of sustainability transformed the idea of development and its relationship with science and technology in the debates leading to the Rio conference in 1992. At the turn of millennium, the UN Task Force on Science, Technology and Innovation, the 2001 UNDP Report on Making Science and Technology Work for Poor, and the International Assessment of Agricultural Science and Technology for Development (IAASTD) are engaged with to understand the significant points of departures on the notions of science and technology for development. Eventually I intend to argue that these changes over the course of half a century do not simply denote chronological eras but represent the shifts in political positions on the struggle between north and south, and rich and poor on the question of distribution and justice. This paper therefore is not a study of the UN impact on development. It is an attempt to engage with the ways in which the "thinking" of one of the important global institutions has influenced the current ideas, practices, and imaginations on science, technology, and innovation for development.

California as a Technoscientific Actor-Network: Micro Practices, Macro Effects, and the Formation of the State as a "Thing". *Patrick Carroll, University of California, Davis*

This paper presents the case of California as an exemplar of technoscientific state formation. The empirical focus is the development of flood control and water infrastructure. Drawing upon themes in actor-network theory, socio-historical technology studies, and work on governmentalities, I argue that the state is not, in the first instance, an actor. Rather it is the effect of the micro practices of actor-networks and their stabilization across space and over time. However, I depart from much of this literature by maintaining a macro analysis. In the first place, I suggest that land, people, and built environment provide macro categorizations (boundary objects) around which micro practices of network assemblage is made strategic. Also, I suggest (drawing on institutional theory) that while macro distinctions between society, economy, culture, and state are discursive effects, they become cognitive resources that are institutionalized and thus shape historical outcomes. That is, they are not merely effects, but emergent macro forces with distinct centers of gravity that separate them as actor-networks with their own complexes of discursive, organizational, and material forms. In addition, actor-networks generate, in the context of states, punctualized actors in the form of agencies, departments etc., which nonetheless are composed of heterogeneous elements such as plumbing, codes, buildings, labs, land, water, fish etc. In the case of California water emerges (at a particular time) as a macro category around which micro practices of governance and science network. It becomes a super-punctualization, expressed in the claim that the "history of California is all about water." In the context of this super-punctualization, a whole range of heterogeneous activities are further punctualized into a range of macro actors with supposedly clear and fixed interests. Though the macro analysis based upon such actors and interests assumes what it should explain, the consequence of macro-ization is very real in its effects. What must be understood first as a discursive process, results in the coordination of heterogeneous actor-network materials around particular perceived interests such that abstractions become concrete. The discourses, and indeed the very idea of the state, becomes very real through a range of practices (organizations) and material forms (particularly material culture). Thus I argue that states are neither distinct objects within societies, coherent actors with internal and external relations, nor simply sets of subjectivities (rationalities,

governmentalities, nationalities) or other discursive effects. The networking of government and science occurs at the micro level, but around macro boundary objects (in this case water). Technoscientific states are, I argue, skeins of actor-networks composed of natural (naively understood, as rendered by technoscience, and existentially lived), technological (material cultural), and social elements (understood as distinctively human). Technoscientific states, while never quite stabilized such that they become objects, are nonetheless genuinely "Things." They are processes and discursive effects, but also thoroughly material formations. They are things in the sense of assemblages; gatherings were matters of concern clash with matters of fact in a mutual process of mangling.

Collaborative Authorship: From Folklore to the Wikiborg. *Shun-ling Chen, Harvard University*

Copyright law, largely based on an assumed image of a romantic author and his genius creativity, grants authors exclusive ownership to their works. Although it defines an area of collaboration, collaborative authorship is more an exception than rule in its paradigm. This paper takes law as a kind of technology that regulates human interactions in a society. Different technologies that turn intangibles into tangibles also affect legal interpretations. Critical Legal Studies (CLS) have demonstrated that property law regulates the relationship between individuals - allowing owners to exclude others from their property. By tackling the question of distribution and ownership, this paper seeks to analyze the intricate relationship between law, human collaborations in the production of cultural resources, and the technologies that mediate them. Borrowing mainly from Star and Bowker's Sorting Things Out and Latour's Drawing Things Together, I advance CLS's property theories by showing how law maps the world through definitions and categorizations, and how different methods of legal reasoning work to turn contextualized opinions into applications of universal standards. I offer examples from three different forms of collaboration (collaboration in the second set fits copyright law's model better; the first and the third set involve communities which have social norms and values that compete with the world illustrated in the state legal system): 1.Forms of production and distribution of cultural resources in indigenous communities usually do not fit into the legal paradigm and are marginalized. As copyright law places folklore in the public domain, commercial exploitations force indigenous communities to expand its interaction with other cultures in a way that is beyond their control. Community members constantly modify the content of folklore and may be granted copyright. When commercial exploitation is disputed, these individual members have better standing than the community in the court. However, their legal defense structured according to copyright law may not reflect community practices and values, and their ownership, if granted by the court, may be further negotiated in the community. 2.Many music groups develop or finalize songs in jamming sessions but assign authorship to one group member. When copyright assignment is disputed, often when the group is dissolved, the court comes in to decide the nature of the collaboration, what kind of and how much contribution is worthy enough to earn a contributor what kind of control over the work. Comparing two similar cases, I will show that technologies that mediate human communications can have decisive roles in court decisions. 3.Massive online collaborative projects such as Wikipedia are facilitated by information communication technologies and alternative copyright licenses which allows participants to bypass copyright law. The collective nature of the projects does not prevent its members from constantly debating individual authorship and attribution. The control one competes for is less the direct control of content, but more merits and opportunities to participate in the community governance, which indirectly affects the distribution and control of resources. The analysis will focus on how community members resort to law and community norms in internal disputes.

Endogenous ESD: Creative Dynamics at the Crossroad of Tradition and Modernity. *Reiko Iwasa, Graduate School of Frontier Science, The University of Tokyo*

The conceptualization of "Education for Sustainable Development (ESD)" was necessitated as a result of the need for reorientation of education discussed at the Rio Earth Summit in 1992 in order for learners to acquire not only knowledge through environmental education but also the skills, capacities, values and attitudes required to ensure sustainable development that is linked with quality of life. Since 2005, a ten-year programme to promote ESD has been implemented globally. However, since the concept/content of ESD were brought into Japan from outside through such exogenous processes, ESD remains an exogenous entity. In Japan, nevertheless, there exists learning that fosters values and attitudes of respect for the environment (UNESCO 2006). While the stakeholders of the ESD programme recognize such learning as ESD, no efforts are being made to date to explore what qualifies such learning as ESD. This study, therefore, aims to elucidate, through the lens of exogenous ESD, the inner structure and the mechanisms of learning embedded in the daily life of people who endeavor to achieve quality of life in their community. Based on the concept of endogenous development envisioned by Tsurumi (1989), that is, the development of sustainable self-reliance based on local natural and human resources, tradition and culture, a hypothesis that endogenous development has a close link with autonomy was made. A rural community called Uwabata Ward in Aya Town in Miyazaki Prefecture, known for its unique "autonomous community center (ACC) system", was identified for a case study. By examining the links among and interactions between nature, local autonomy, labor, life, tradition and culture, and social capitals, six categories of communal learning were identified, namely "family and community life", "childhood play", "organic agriculture", "minor subsistence", "folkways", and "the management of the autonomous community center". The analysis highlighted three attributes: spiritual, natural and social, behind the communal learning, and the broader framework of development behind the case in Uwabata was illuminated. The framework originated from the efforts of the former Town Mayor, who succeeded in revitalizing Aya Town, which was once plunged into a recession, by passing down his visions/values of endogenous development to town residents through the ACC system, which could be considered as a form of endogenous ESD. The case study argues the real meaning of human/social development and the possibility of an alternative approach to ESD, namely endogenous ESD, as a way to build a sustainable community through the re-creation of tradition in the process of local autonomy based on the "capital of relationship" that nurtures the relationships between nature and people and the sense of solidarity and mutual-help among the residents. Endogenous ESD requires strong contextualization within the "place" and "natural environment" where people live, work, and self-rule to achieve quality of life, and where tradition and modernity cross and creative dynamics emerge. Such cases demonstrate "education for sustainable development" in the true sense of the term. This study aims to propose an alternative approach to sustainable development other than the approach based on knowledge and values of science and technology.

The MT Heibei Spirit oil-spill disaster and its impact on the community life. *Jaeyeol YEE, Seoul National University*; *Sun-Jin YUN, Seoul National University*; *Inkwan Chung, Dept of Sociology, Seoul National University*; *joon Han, GSPA, Seoul National University*; *Chang Deok Kim, Graduate School of Environmental Studies Seoul National University*

MT Heibei Spirit oil-spill, occurred in December 2007, is one of the most dreadful man-made disasters in Korean modern history, leaving deep impact to the natural environment as well as to the social life of the local community. A crane barge owned by Samsung Heavy Industries being towed by a tug collided with the anchored crude carrier Heibei Spirit, carrying 260,000 tonnes of crude oil, and resulted in the leaking of 10,800 tonnes of oil. The spill occurred near Asia's largest wetland areas, harboring

many fishing villages, migratory birds and national maritime park. The massive contamination has created many unprecedented repercussions in Korean society. Within one month, more than one million volunteers participated in the cleaning up the spill. Politically, the spill has caused heated debate about who is responsible to the disaster. International Oil Pollution Funds (IOPC) will be responsible to compensate to the damages, but it may cover only small part of the total damages, thus there is waves of debate for the responsibility of central government and Samsung, the owner of the crane barge. The nature of the spill can be explained by many theories of disasters. Utilizing the theory of normal accident, originally proposed by Charles Perrow, we will explore the nature of the disaster. We will also report the changes of the community life, based on our two-year long field research on a fishing village located at the nearest distance from the spot of oil spill. Especially we will focus on social factors that determine the resilience of a community against disasters, such as trust and social networks. By way of reporting the case, we will explore the relationship between technological risks and the capacity of a community to respond.

052. Crossing Boundaries of Western Culture

1:15 to 2:45 pm

13: 1321

Participants:

Reflections on a Non-Western Agenda for Science and Technology. *Wiebe E. Bijker, Maastricht University*

Can there be self-rule for the global south and east on science and technology? What should be an agenda for science and technology dedicated to self-defined development of countries in east and south? Bijker will report and reflect on his collaborations with Indian scientists, scholars, and NGOs to formulate an Indian Manifesto on Science and Technology. For this Knowledge Swaraj, or self-rule on knowledge, the authors were inspired by Hind Swaraj (1909), in which Gandhi argued one century ago for India's self-rule. Does self-rule on science and technology only imply a specific science and technology policy, or is a more radical questioning of the science and technology systems called for?

The Formation of Hybrid Colonial Identities in Institutions of Higher Education: The Example of the Dutch East Indies. *Hans Pols, University of Sydney, Unit for HPS*

Institutions for higher education in the colonial (as well as the post-colonial) world are excellent sites to investigate the encounter between East and West, and the formation of unique and hybrid colonial identities. In a number of colonial contexts, they have been central to the formation of nationalist movements. In this paper, I investigate the two medical schools in the Dutch East Indies, which fostered radicalism and nationalism among its students. These schools were the STOVIA (School for the Education of Indies Physicians, Jakarta) and the NIAS (Dutch Indies Physicians School, Surabaya). A great number of Indonesian nationalist were physicians (or, at least, received some training in these medical schools). Student Almanacs and student newspapers are, and have always been, excellent sites for the presentation, performance, and elaboration of student identities. In a colonial context, it can be expected that a great amount of "identity work" needed to be performed. In these student publications, students did not express a great number of radical political convictions. However, they wrote a great deal about their identities as students—how they were exhausted from studying, how professors were cruel giving very hard exams, and how they lacked the capacity to deal with the rough and tumble of the real world (these, naturally, are common features of student writing all over the world). In addition, several accounts of confusion and alienation were given (which is not that uncommon either in student writing). But in the case of some medical students, the confusion is the result of their acquaintance with western medicine, science, and thought, which has forever alienated them from their own parents and families. They felt they could not discuss their ideas with them and often visited home as little as possible. On the upside, these students were greatly impressed with values they ascribed to the west: rationality, modernity, technology, rationality. They saw these values as essential in moving their own country to the future, and were immediately wondering how they could make these values generally accepted by the indigenous population. This sense of alienation also promoted strong group ties—after all, it was only within the very small group of Indonesian students that they could discuss these matters. This made them feel part of an intellectual elite. How this elite could create a position for itself in colonial society was a difficult question—should it be in association with the colonial powers, or resisting them? I will conclude with some comments about the relevance of this analysis for the formation of the nationalist movement in the Dutch East Indies. Rather than a uniform process, I will emphasise that the different participants in this movement followed highly individual and idiosyncratic developments that, eventually, led to their participation in the politics of independence.

Religion in action: When theology and pastoral work meet Latourian science studies. *Zdenek Konopasek, Charles University in Prague/The Academy of Science of the Czech Republic*

STS arguments about science (as well as about STS approaches and theoretical frameworks) are occasionally developed and “tested” by excursions to some other fields, such as political theory or economics. Among these fields, religion belongs to rather neglected areas – the most important exception being the work of Bruno Latour. Latour, referring mainly to religious icons and talk, challenges traditional thinking about differences between science and religion. He argues that we should understand religion in its own terms (“religiously”) while seeing it as something “local, objective, visible, mundane, unmiraculous, repetitive, obstinate, and sturdy”. When hearing about religion, we should avoid, Latour insists, turning our attention “to the far away, the above, the supernatural, the infinite, the distant, the transcendent, the mysterious, the misty, the sublime, the eternal”. Only then we can reframe the relationship between science and religion in a new, mutually meaningful and acceptable way… In this paper I will critically discuss and perhaps also make more refined these Latour’s arguments. Empirical evidence will be taken from my current ethnographic research on religious apparitions and demonic possessions, inspired by Latourian science studies. A case study on Marian apparitions in Eastern Slovakia (1991-5), for instance, nicely documents how religious practices do not simply aim at establishing some belief in (unwarranted knowledge of) non-present, distant entities; in many respects, these practices rather redirect our attention to what is present, close, and living. Contrary to what Latour seems to suggest, however, I will try to show that the respect toward the local, visible, graspable, mundane and repetitive cannot and, after all, is not (by various participating actors) separated from the interest in or the reality of supernatural, mysterious and transcendent religious phenomena. On the contrary, the two orientations are constitutively connected – and sometimes such a connection is even clearly reflected by priests or worshippers.

053. Session of Technology, Environment and Health Risk Governance III

1:15 to 2:45 pm

13: 1322

At the end of the twentieth century, rapid development of society on a global scale caused vast changes and transformation. While industrialized society entered a new stage of evolution, globalization too brought with it a number of fresh challenges, on the one hand breakthroughs in newly emerging technologies, have brought with them global implications and developments. Yet no matter whether as a result of traditional technology or through the process of constructing new forms, globalization, with its rapid speed of development, has given rise to environmental pollution,

transmittable diseases and food concerns, including global warming, disputes over CO2 or landfills, environmental hormones (persistent organic pollution, POPs) and HIV/AIDS.
A side effect of globalization, these newly emerging and closely observed interactions between technological, environmental and health risks which the aforementioned developments have given rise to, are fundamentally interdisciplinary in nature. Having been caused by both traditional and modern technology, they have overlapping and complicated environmental, technological, ethical, social risk perception and attributes of trust, as a result, this has already become an important governance issue and challenge for many countries around the world. It is in this context that this panel on 'Technology, Environment, Health and Risk Governance' implements this plan; hoping that by encouraging greater interaction and discussion, to get the ball rolling in terms of proposing related thesis, while experiencing a greater interflow of ideas and perspectives which will in turn deepen localized social risk governance research.

Participants:

Ecological Surveillance and Cultural Negotiation on. *Jackson Hu, Department of Human Development (Anthropology Program)*

In the post-martial law era after 1987, Yami people not only have struggled to revisit the ancient ecological memory, but also re-marked place naming to engage local modern enactments. Past anthropologists treated Yami place memory as a great chain of chapter myth, chiefly serving to consolidate tribal leadership but largely leaving spirits unexplained out of human social world. The meanings of spiritual landscape had been concluded with a moral closure in which dominant groups were primordially legitimated because their ancestors had led villagers in myth. This analysis of recent landscape narratives challenges such a static view of moral landscape, and identifies the shifting cultural knowledge of ecological figures, in terms of spiritual and economic meanings of changing environmental use, biological diversity, and land memory. In 1990s, the waves of international conservation agenda came into this region, and were soon articulated with local desire to recover from the ecological poverty on Orchid Island. A butterfly recovery project was appropriated by local conservation organizations to revitalize ecological richness against the silent landscape that species' play and ecological memory had been long displaced. Indigenized conservation has greatly encouraged a self-sustained landscape against government and market interruptions when global economies integrated and marginalized local subsistent communities. To the Yami, returning butterflies symbolized a political struggle to defense their ecological landscape, prostrated as an ecological, economic, and cultural renaissance. Selectively borrowing (inter)national agenda (conservation and species recovery) re-establish free play of past landscape spirits, Yami people continued ancient memory of ecological figures, and made natural objects again the nexus of cultural negotiations against oversea national state and economic dominance. Their balance between immediate environment and global agenda transformed landscape memory for contemporary purposes, restlessly intending to justify human domination on Nature.

Analysis on the risk in the process of technical use. *Fan Chen, Northeastern University*; *Huiduan Ma, Northeastern University*

The use of technology, especially the use of high-tech will inevitably bring about all kinds of risk to human society. Furthermore, with the frequency of technical use being increasingly high, the risk involved in technical use itself becomes more complicated and unlimited. Risk is the inevitable price we pay for the all kinds of activities based on technical use, so in face of any risk, our human beings should establish a sort of different and wiser reason which based on the understanding of human nature. The key words: technical use; risk; humanity

Do we have an ethic of causal cognition in assessing post-vaccination harms? *Kevin Chien-Chang Wu, Department of Social Medicine, National Taiwan University College of Medicine*

In Taiwan, as the H1N1 flu epidemic began to spread, the government has been eagerly promoting the voluntary vaccination to prevent H1N1 infection. As reported in January 2010, there have been over five million people vaccinated. However, more and more (> 230) case reports of could-be severe post-vaccination adverse events appeared. As the media revealed these unfortunate events, the willingness of people to receive injections lessened. Even a self-help group of H1N1 vaccination harm was established for receiving complaints and conveying them to the government. In the presentation, I will trace the media reports to show that fierce debates between the government and the suspect vaccination victims are focused on whether the vaccination caused the illness that happened after vaccination. I will argue that for handling these kinds of cases, randomized controlled trials are not the golden standard to refer to in assessing the causal relationship. There might be a variety of combined factors that led to the post-vaccination harm, which might not be counted as statistically significant in a trial. Furthermore, I will follow Nancy Cartwright (2007) in positing that the metaphysics, method and application of causal theories must match together. There are more than one causal theories for assessing vaccination harms. The causal theory used for population governance is different from the one used for single case evaluation, which might combine together salience, temporality, physiological possibility, etc. In addition, since people received vaccinations contributed not only to the protection of their own health but also to the protection of the health of community, it is necessary that the official assessment committee must be sufficiently lenient in making causal judgment. To wit, the post-hoc compensation is one way to address the fair distribution of burdens and benefits of vaccinations. Third, the composition of the official assessment committee must maintain the credibility in the eyes of the public. The assertion of big science in the committee that lacks humane concerns will not build up credibility and ease the debates or sufferings. All three are important points of the ethic of causal cognition in assessing post-vaccination harms. One important caveat in the above ethic is that it is necessary to conduct public communication that addresses the ethic of causal cognition and let people develop a good enough understanding of what is the official frame of causal cognition about post-vaccination harm. Thus, the citizens could take the causal frame as one of the factors to consider in their deliberation on whether to receive vaccination.

Chair:

Paul Jobin, CEFC Taipei office

Discussant:

YU-FENG Wong, National Cheng Kung University

054. On the Absence of Absences

1:15 to 2:45 pm
13: 1331

This panel addresses absences - the gaps, silences, and remains within the construction of knowledge and ignorance -- in order to contribute to an ongoing STS dialogue; one that has roots in Bloor's "sociology of error" to more recent work in agnotology (Proctor and Scheibinger) and in residues (Bowker and Star). From feminist and postcolonial theory, we have learned to be continually vigilant about the dynamics and non-dynamics in knowledge construction and application. This panel addresses these negations, unseen crevices, deletions, and leftovers from multiple perspectives. Its aims to identify and theorize some of those areas that demand our vigilance in order to broaden and provide systematic ways to understand how absences and gaps are a continual part of social interactions and our STS studies.

Participants:

Agnotology and Privatives: Parsing Kinds of Ignorances and Absences in Systems of Knowledge Production. *Jennifer Croissant, University of Arizona*

Agnotology as constituted by Proctor and Schiebinger faces two major challenges. The first is that it recapitulates the problem that Bloor identified with the vernacular "sociology of error" and

its asymmetry. In general, we can generate explanations for false beliefs but summarily exempt validated knowledge from symmetrical analysis. Other recent work (Gross, Hess) faces similar challenges. The second problem concerns the complexity of studying privatives, concepts or ideas which are known only in their absence. For example, technically speaking, cold is the description of an absence of thermal energy, not a thing in itself. This paper is an exploration of the concept of agnotology in relation to studying other privatives, such as silence, in the context of a symmetrical approach. The project allows for a more systematic approach to studying the lacunae of knowledge production across disciplinary fields.

Science, Ignorance, and Secrecy: Making Absences Productive. *Brian R Rappert, University of Exeter*

In recent years, recurring attention has been given to the question of what researchers in STS and elsewhere can disclose; particularly in relation to what they say about those under study. When researchers are working under conditions characterised by secrecy and a limited access to information, then the difficulties faced are all the more acute. This presentation examines the political, ethical, and epistemological challenges associated with how we manage what is missing within our writing. Some of the argument is based on an ethnographic engagement within diplomatic and security communities. I want to consider the implications of the disclosure rules, confidentiality agreements, informal arrangements, etc. associated with contemporary research. I also want to go further though to ask what novel writing strategies could enable us to undertake a critical engagement with the worlds we study. In doing so, a goal has been to determine how limits to what can be said could figure as a productive part of our research accounts.

Alter-Ontologies: Justice and the living world. *Dimitris Papadopoulos, Cardiff University*

The paper examines the elusive issue of justice in science and technology studies. In particular it discusses how justice plays a key role in the emergence of alternative ways to engage with technoscientific research and applications. The paper argues that such alternative practices produce critical knowledges and promote new everyday relations between humans, other biological species and things: alter-ontologies. Re-appropriation of patented technologies, independent research initiatives, permaculture and bio-dynamic agriculture, sustainable human-animal ecologies, peer to peer infrastructures, earth activism, recombination of technological apparatuses -- all are diverse ways to reclaim technoscience for creating alternative relationalities in a living world. The issue of justice is in the core of alter-ontological practices. Moreover, rather than simply an ethical issue, relations of justice are processes which organise the complex traffic between humans, non-human species and artefacts. Instead of thinking justice only as a lack, that is as an action that has to be instigated in order to reverse prevailing injustices of contemporary stratified technoscientific worlds, this paper argues that justice is primarily a practical and material process that contributes to building and sustaining alternative communal cross-technological and multispecies spaces.

Music, Religion, Politics, and Everyday Life: The Tensions of Utopianism and Pragmatism in Movements for Change. *Peter Dreier, Occidental College*

From the scribes and rabbis who wrote the original Torah, to the troubador-activists who sang "Which Side Are You On? and "Waste Deep in the Big Muddy," to the gangbangers and hip-hoppers who create contemporary street rap, the relationship between culture, politics, religion and everyday life has been poorly understood. As Bloor observes: "In fact sociologists have been only too eager to limit their concern with science to its institutional framework and external factors relating to its rate of growth or direction This leaves untouched the nature of the knowledge thus created." There is an obvious tension between romanticism and reality, between humanity and barbarism, between self-reflection and communal expression, which pervades both the written word and the oral tradition. Can a society promote utopianism and dystopianism simultaneously, while allowing its governing officials, whether military conquerors or democratically elected, to perform the necessary day-to-day functions of street-cleaning, sanitation, animal rescue, industrial production, hunting-and-gathering, maintaining law and order, and (what Heideger called the "organicity of intellectual work") educating children and reproducing the next generation. We might call this a kind of scientism of contradiction, or the contradictions of scientific production, or the contradictory intellectual discipline of everyday life. In other words, can the rigours of so called "pure" intellectual work (including those of the priestly class and its modern counterparts), the artistry of craftwork (or the craft of artistry), and the degradations of subsistence agriculture, mining, factory work, and retail sales co-inhabit the same society without igniting the ticking time bomb of social implosion, as we've recently seen in riots in the French suburbs and in the ghettos and barrios of Los Angeles? How, in other words, does the globalization of both production and knowledge work (the so-called "Walmartization" of societies) challenge our ability to think clearly about what is true in contrast to what is delusion? Self-delusion and self-discipline inhibits the reflective self, the postmodern membrane, the ecclesiastical impulse forbidden by truth-seeking and sun worship, problemetizing the inchoate structures of both reason and darkness, allowing knowledge, half-knowledge, and knowledgelessness to undermine and yet simultaneously overcome the self-loathing that overwhelms the gnostic challenge facing Biblical scribes, folksingers, and hip-hop rappers alike. Sociologists ignore these topics at their peril.

The motility of the ethical in bioscience: the case of care in anti-ageing science. *Maria Puig de la Bellacasa, University of Leicester*; *Joanna Latimer, Cardiff University*

In this paper we discuss the shiftiness of the ethical in anti-ageing bioscience by looking at the problem of care. Rather than seeing ethicality as an abstract, normative issue, we follow it as it evolves within the everyday ethos and socio-material constraints of an emerging bioscience. In particular we focus on shifts in ground that bring matters of care into presence one moment and absence the other. These everyday processes of inclusion and exclusion (literal/figurative) are key to power relations. Attention to the motility of care helps elucidate how ethics are done and undone through the making of specific technoscientific formations. By examining the play between the absence and presence of care we aim to illuminate the emerging ethical problems raised by contemporary anti-ageing biosciences.

Mapping Environmental Knowledge Gaps in Post-Katrina New Orleans: A Study of the Social Production of Ignorance. *Scott Frickel, Washington State Univeristy*; *M. Bess Vincent, Tulane University*; *Richard Campanella, Research Scientist*; *Elizabeth Fussell, Washington State University*

As a rule, historians, philosophers, and sociologists of scientific knowledge study knowledge making; seldom do scholars study the non-production of knowledge. Yet a growing body of empirical research demonstrates that scientific work involves the interplay of both processes. Empirical research on ignorance identifies two basic modes of cultural production: ignorance that results from intentional, purposive, interest-driven action in discreet organizational or institutional settings (e.g. through secrecy, deceit, or suppression) and ignorance that is the unintentional, indirect result of longer-term historical and cultural processes (e.g. knowledge lost through epistemic or cultural drift). The production of environmental ignorance in New Orleans has elements of both. In a larger study we describe knowledge gaps in the urban hazardscape as the largely unintended outcome of organizational practices and institutional logics that guided decisions of scientists and technicians at EPA and in the field in the specific context of Katrina's infamous deluge and tragic aftermath. Our focus here is narrower. In this study we present a novel approach for identifying the socio-spatial dimensions of knowledge gaps produced through regulatory action by environmental agencies. Our four-step

analysis features the U.S. Environmental Protection Agency's (EPA) hazard assessment of Orleans parish, Louisiana following Hurricanes Katrina and Rita in 2005-2006. We begin with an overview of the hazard assessment project and summarize the kind and quantity of contaminants identified by more than 106,000 analytic tests conducted on New Orleans soil and flood sediment. Next we geo-locate EPA sampling sites to identify flooded city blocks that were and were not targeted by EPA. Once identified, these "knowledge investment" and "knowledge gap" blocks are then paired with socio-demographic data from the 2000 U.S. Census and with spatial data on the location of elementary schools, parks and playgrounds, industrial brownfields, and regulated hazardous waste sites and storage facilities. Finally, we conduct bi-variate and logistic regression analysis of these data to statistically investigate the relationship between knowledge gaps and the location of known environmental hazards (brownfields and regulated waste sites) and probable concentrations of environmentally vulnerable populations (elementary schools and playgrounds). Findings point toward the theoretical elaboration of knowledge gaps as epistemic forms whose production and organization shapes broader patterns of knowledge/ignorance within regulatory regimes.

The Absence of Science and Technology Equals Development? *Wenda Bauchspies, Georgia Institute of Technology*

One of the earliest rationales for development was based upon the assumption that nations that lacked "our" science and technology were considered: developing, least developed, or undeveloped countries. Fifty years later this rhetoric defined by absence or lack can still be found in development policy documents; however, it is being challenged and questioned in the fields of development studies and postcolonial studies on the grounds of power, cultural imperialism and colonialism. In this presentation I would like to focus on this "absence or lack" of science and technology in development as a means to identify and theorize an arena that demands further scrutiny in order to disrupt the current circle of development being implemented and defined around the idea of increasing science and technological capacity. After years of researching and living in a "developing country" and hearing stories of technologies and development projects that did not "stick" or that arrived, were implemented and then faded away, I propose to ask the question of what are the cultural factors that are ensuring that science and technology do not equal development and how their absence and presence feeds the need for development.

Chair:

Jennifer Croissant, University of Arizona

055. Ethics Guidelines, Ethical Practice, and Ethics, Too

1:15 to 2:45 pm

5: 511

Participants:

Ethical Guideline for Human Genome Research in Japan and Embarrassment of Ethics Committees. *Nobuo Kurata, Graduate School of Letters,Hokkaido University*

In this paper I'd like to analyze the structure of ethical regulation system of Japanese Genome researches and point out some problems of it. The problems of regulation system for biotechnological research are among the most important topics in STS. The studies of the functions of ethics committee are also among important problems of regulation of biomedical science and technology. In 2001, the Guideline for genomic analysis research was established by three ministries of Japanese Government (revised in 2004).This Guideline covers all human gene analysis researches in Japan. The purpose of the Guideline is to prevent the inadequate usage of human specimen and to protect genetic privacy of the donors. The Guideline requires the review and approval of protocols by ethics committee. It divided samples into three groups according to whether the informed consent is given or not (A group :with IC for genetic research, B group: with IC for biomedical research but not for genetic research, and C group :without IC at all). After the enforcement of this guideline, the researches with stored samples are increasing, for hospitals and laboratories have huge sum of stored sample (most of them are B-type or C-type i.e. samples used for ordinary clinical test).If some conditions are satisfied, and ethics committee permits, researchers can use them. In short, ethics committees have to decide whether it permits research with stored sample. Though the final judgment whether to use the stored samples is left to each ethics committee, committees might judge differently on similar protocols. It is because competences for review of ethics committees are different, and the qualities of the reviews by committees are not controlled. Most of the members don't understand the reasons and implications of items in the guideline on usage and collection of stored sample in detail. There is no guidebook for reviews, nor training program to improve the committee members' competence. Japanese Government has not shown clear rules or standards for usage of these samples. Some IRBs and ethics committees might be also embarrassed because they sometimes have to make judgments on difficult issues such as allowing proxy consent, disclosing genetic information to the donors' relatives without donors' consent. In difficult cases, each committee has to decide by themselves. The crucial point is that Japanese regulation system for genetic research lacks systems of principles and ideas. The guideline has no relation to other regulation of medical research in Japan. Moreover, in Japan we don't have any basic rule for medical research. In this paper I'd like to treat these problems from my experience as a member of working committee for drafting the Guideline and of some ethics committees.

Framing Bioethics in the Governance of Stem Cell Research in India. *Shashank Shekhar Tiwari, Institute for Science and Society, University of Nottingham*

India is emerging as one of the leading centres for stem cell based research, having a significant number of public hospitals, private clinics and companies active in this area. India is also becoming a destination for what has been described as 'stem cell tourism' with Western patients being offered therapies for certain conditions such as spinal injury, muscular dystrophy, Parkinson's disease, multiple sclerosis, diabetes, retinal pigmentosa etc (Blakely 2009; Patra and Sleeboom-Faulkner 2009). However, there is a widespread perception that clinical research and therapeutic applications of stem cells in India do not meet international rules and regulations and that this work is flourishing in a 'bioethical vacuum' in the guise of experimental therapy (Sleeboom-Faulkner and Patra 2008). The various clinics and companies have been accused of making false claims about a wide range of stem cell treatments and even in some cases, fake declaration of having approval from governing bodies (Pandya 2008; Sipp 2009). As a result, India is being described as a global locale for 'maverick' science (Bharadwaj and Glasner 2009). Drawing on the work of Bharadwaj and Glasner (2009) and previous research on the 'political economy of hope' in this domain (Brown and Kraft 2006), this paper aims to present a more complex picture of the relationship between different stakeholders and narratives in the governance of stem cell research in India. Following a summary of survey data on key projects in this area, the paper will draw on interviews with scientists, clinicians, bioethicists and policy makers associated with the development of stem cell research to examine: a) the relationship between global and local actors in the 'Indian' stem cell economy; b) the framing of ethical principles and narratives by these different actors and c) the implications of the above for understanding how research is governed. References: Bharadwaj, A. & Glasner, P. (2009) Local Cells, Global Science: The rise of embryonic stem cell research in India, Routledge. Blakely, R (2009) Stem cell experts sceptical of Dr Geeta Shroff's miracle cure claims. Times online, Nov 7, Available at http://www.timesonline.co.uk/tol/life_and_style/health/features/article6906985.ece [Accessed Dec 2009]. Brown, N. & Kraft, A. (2006) Blood ties-banking the stem cell promise. Technology Analysis and Strategic Management, 3/4, 313-327. Pandya, S.K.

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Practical ethics in neuro scientific/ technological research - brain machine interfaces and patient care. *Melike Sahinol, Postgraduate Programme on Bioethics University Tuebingen, STS Fellow (Harvard Kennedy School of Government)*

Neuroscientific and neurotechnical innovations are raising fundamental questions about what it means to be human. In doing so, they are also changing the ways in which patients suffering from debilitating illness are understood, cared for, and able to live in the world: they are producing new forms of human action, new methods of communication, and new conceptualisations of patient autonomy. Many of the patients directly affected by neurotechnical innovations are already dependent of medical technologies to the extent that they could not survive without them. There is a need to describe both empirically and analytically the conditions through which these technologies emerge, and the role of various actors and understandings, both social and scientific, in the innovation process. Of special importance is the role of ethics, both formal and personal, in the development of such technologies as they are adapted to model and address human disease. This paper examines the place of ethics in the neurotechnical innovation process. It does so through an analysis of the patient care complex in the neurotechnological innovation process, with a focus afforded to patients that are treated with neuroscientific medical technologies, i.e. Brain Machine Interfaces (a direct communication pathway between a brain and an external device) or Deep Brain Stimulation (surgical treatment involving the implantation of a medical device, which sends electrical impulses to specific parts of the brain). Based on interviews with several neuro scientists/ surgeons, patient care takers, and ALS (Amyotrophic lateral sclerosis is a form of neuron desease, which causes gradually muscle weakness) patients who worked already with BMI, I argue that the patient care complex is distinguished by distributed ethics: If we understand ethics as technology itself, we can see that it produces new action, insights, motivations, and dilemmas during the innovation process. With "distributed ethics", I would like to draw on the notion on knowledge as an element completely entangled in networks (Latour 1987) or in other words "distributed knowledge", where the important idea is that different complementary bits are distributed in an interactive network (ANT) and that there is no centre, no periphery but distributions, interactions, etc. Thus causes a problem (or at least a problematic situation) for professionals of ethics but also for the innovation process itself. There is a new type of agency or performativity which comes with ethics: ethics produces a new kind of normativity and there is a contradiction with the distributed character of ethics. We also have to consider that norms of research are more flexible, because there is a promise of innovations that may improve patient's problems. This exaggerates the problem of ethics in the innovation process and the neuro scientific/ technological innovation process itself.

Rethinking the Concept of 'Person'. *Akira TSURUSHIMA, Kaisei Gakuin High School*

In this presentation I will focus on the problems of "person" in biomedical ethics. In the debate of bioethics and medical ethics many people refer to the concept of 'person' in order to decide how to do in this and that situations. For example, ES cell is not a 'person', so it is morally acceptable to use it for experiment. A severely disabled fetus is not a 'person', so it is morally permissible to abort it. A hopeless narcosis is not a 'person', then it is morally acceptable to end his or her life. It was after around 1950's when the concept of 'person' come to be used as stated previously. And the 'person' was recognized as recently due to Joseph Fletcher and Paul Ramsey. They used the 'person' as an important concept to influence the decision making in biomedical ethics. Talking about the definition of 'person' in Japan, we usually refer to Michael Tooley's paper 'Abortion and Infanticide' written in 1972. Previously, Fletcher and Ramsey got less attention because much of their arguments are from Christian point of view. So in this presentation, I will treat and analyze Fletcher's and Ramsey's argument of 'person'

"Ethical review" as a tool to connect scientists and society: How can we improve it? *Ayako Kamisato, The University of Tokyo*

Any scientist who conducts biomedical research involving a human subject has to file an application for an ethical review with an ethical review committee that also includes non-scientists, and also has to obtain the committee's approval. This has become a worldwide rule though there are differences in terms of the reviewing method. It can be said that an "ethical review" acts as one of the tools that connect scientists and the society. Further, in Japan, it is obligated that an ethical review committee be set up in each organization under the "Ethical guideline on clinical research" that came into force in 2004. However, the quality of ethical review at ethical review committees in different organizations varies and cannot be said to be generally high. Under the revision made to the Ethical guideline on clinical research in 2008, a biomedical scientist is obligated to take research ethics training, and each organization has to try to provide some training to the members of its ethical review committee. As such, it is important to improve the quality of ethical review by "educating" biomedical scientists and ethical review committee members. However, at the same time, making the provision for a "support" system is also equally important. Here, a support system is a system that the scientists can consult with immediately when concerns and/or issues arise regarding ethical review applications, brings the application documents up to the level at which the members of the ethical review committee can concentrate on reviewing, that allows the policy decisions to be made as and when problems pertaining to ethical reviews arise, etc. To support its scientists and the members of its ethical review committee, the Institute of Medical Science at the University of Tokyo (IMSUT) established the Office of Research Ethics (ORE) in August 2008; the ORE started full-fledged operations in April 2009. This is the first such office in Japan that comprises mainly of academic staff. In this presentation, I would like to introduce the experience of IMSUT ORE, and propose some ideas to improve ethical reviews from the viewpoint of connecting biomedical scientists and the society.

Ethics Commissions- Solving the Problems of Science? *Corinna Jung, Münchner Kompetenzzentrum Ethik, Ludwig-Maximilians-University*

Outline In today's societies, many problems can hardly be solved by only one scientific discipline anymore. For instance most cases of death and dying take place in hospitals and nursing homes. There the process of dying is often highly regulated by physicians and health personnel. And often there are difficult questions to answer like continuation or abandonment of life support (e.g. parenteral nutrition or artificial respiration). But how do the health personnel deal with those issues? Physicians neither want nor can make those decisions alone anymore. There is the patients will that needs to be reflected, there are legal regulations to be regarded, there are even economic aspects that can't be overlooked. So how to solve those problems? That's why ethics committees on different levels of society become more and more important. Ethics as a new (old) scientific discipline seems to arise. Most hospitals already have their own ethics committees, and also on the political level more and more ethics commissions get established to prepare advice for such difficult societal questions. But how do these committees deal with those difficult end of life subjects? How do they find solutions? How does

knowledge emerge in these committees? And: Who selects the commissioners of those committees? And what members are selected for those committees? Do maybe own commission logics develop? I will answer these questions by having a closer look to two ethics commissions, which were to prepare recommendations for the German Parliament and the Government for the legal regulation of advance directives. Both commissions met almost at the same time but came up with very different recommendations. Summary of Methodology Participant Observation in meetings of one ethics committee was used to get first impressions of the research field. 29 expert-interviews with members of both ethics committees were conducted. This data is analyzed with the methods of Grounded Theory of Anselm Strauss. Also, documents of both commissions were collected for a document analysis: especially different versions of the final report of one commission, including all changes during their discussions, as well as other commission papers. Contribution to STS literature Regarding our society as a "post-social science society" (Knorr-Cetina 1998), I will analyze the networks around those societal problems like dealing with death and dying and take a close look to the ethics commissions. I will analyze the "seamless web" (Law 1991) around the regulation trials to advance directives and look for networks in the meaning of ANT (Akrich/Latour 1992, Latour 1996)

056. Anticipating Indian Technological Futures

1:15 to 2:45 pm
5: 512

Post-independence India has always had a complex and close relationship with modern, Western, technology. The country's technology mission once meant large, spectacular, state-driven efforts oriented towards national economic development and military systems; now, technological change is now associated with information and communication technologies, driven by a dynamic private sector embedded within global capitalist networks. This broad outline masks the complexity of changes that are taking place within the relations of state and society, and between old and new technologies. This proposed panel of papers from well published STS scholars working in Asia and North America offers a unique insight into the latest STS research on India from multiple vantage points and theoretical positions. The papers in this panel range from the rural micro study (Abraham) to the national scale (Phillip), from urban civil society (Sreekumar) to marginal communities (Abraham). Collectively they offer grounded critiques of governance, environment, development and risk, based on extensive fieldwork and new data collection. Together, these papers offer a nuanced and complex understanding of technological futures in one of Asia's most dynamic societies.

Participants:

Civil Society in the Information Age: Urban Governance and the Politics of the New Techno-Class in Bangalore, India. *Sree Kumar, National University of Singapore*

T. T. Sreekumar, National University of Singapore. The increasing political visibility of professional and cultural intermediaries as a social class in India is a relatively new phenomenon mediated inter alia by new media technologies and the global IT surge. A spectrum of confrontations ranging from public policy controversies to intense land struggles have emerged as a consequence of the informatization process in the urban spaces in India. Several civic associations and 'virtual' as well as "real" interest groups and communities of action and discourse with involvement of members from this new social class proliferate in the Mega Urban spaces. The paper raises some analytical concerns based on field work carried out in Bangalore. First of all, does this phenomenon entail the emergence of a politically ambitious new techno-class? How do we conceptualize and substantively re-explore the position, status and degree of influence of the new techno class as a social force? How do we study the political and social character of this new social class? How do we understand the emerging nature of State-civil society conflicts/collaborations mediated by the new techno class and analyze the new politics and frictional models of synergetic interaction between state and civil society in urban governance? The discussion is juxtaposed simultaneously against the backdrop of recent scholarly attempts to understand the emerging subject positions of the new middle class in the neo-liberal India and new media theories that focus on human and digital technology interface for augmenting social networks.

Biological Citizens: Radiation and Risk in Southwest India. *Itty Abraham, University of Texas at Austin*

This paper is based on qualitative interviews with 75 people living on or near the coast between Nagercoil (Tamil Nadu) and Chavara (Kerala) between January and June 2009. This is an area of high background radiation due to the proportion of naturally occurring radioactive thorium present in the beach sands. Respondents were between the ages of 25 and 70 and included men and women. Given the hazards of living in an area of high background radiation, interviews sought to determine local understandings of their environment, and, in particular, why they continued to live in this area despite the risks to them and their children's health. We usually think of risk as a measure of anticipation of insecurity over the reproduction and maintenance of body, property, and institutional wellbeing. Risk in other words, prefigures the uncertainties of what is yet to come. This paper will propose that what we call risk is only one among a number of conditions interpellating marginal communities facing already-existing vulnerabilities. Drawing on a case study of a coastal community in southwest India exposed to high levels of natural background radiation for over a century, this paper argues that the future temporalities of risk -- biopolitical anticipations of danger, threat, and radical uncertainty -- are relatively minor in relation to the modern politics of recognition: a subjectivity that is premised on memory, location, and spatial immobility.

Rethinking Environment, Politics, Development and Culture in Indian STS. *Kavita Philip, University of California at Irvine*

Development projects in the early years of Indian independence were marked by infrastructural and ideological commitments to the poor. More recent investments have responded to the needs of the information technology (IT) sector, in the belief that what is good for IT is good for the nation. What changes has this brought to the problems of development and modernity, environment and sustainability, culture and geopolitics? Thus paper offers some ideas on how we might approach the integrated analysis of environment, politics, development and culture by reviewing a case study and offering interdisciplinary methodological reflections. It weaves together issues of Indian regional modernities, technoscientific knowledge, and gendered subjects to suggest that increasing the complexity of our models might improve the efficacy of our solutions.

Discussant:

Kath Weston, University of Virginia

057. Fuel, Waste & People: The participatory blues and the politics of energy

1:15 to 2:45 pm
5: 513

This panel discusses both ends of contemporary resource politics, that of the production of energy (using oil, gas, and nuclear) and of managing the waste products of energy industries (specifically, nuclear waste). We discuss energy politics in a global context, with examples drawn from Canada, Finland, Sweden, Belgium, as well as South East Asia and the Caspian Sea. In all cases, we are concerned to discuss how political machinations with global repercussions and global dimensions nevertheless intersect with and are fractured through local publics. In some places this means we ask what happens when a physical object, such as a gas or oil pipeline or a potential nuclear waste disposal repository, is perceived differently by different groups associated with the technical and socio-economic project. Does the object only acquire a meaning in the context of interactions over its character, or does it enter a situation already meaning(ful)? Is there a different kind of politics depending upon the answer? In other places we note that politics itself is the object, as when what constitutes democracy is actively created in order to house a desired material set of objects (like a waste disposal repository). We also consider

that many of us do not know what we are talking about when we talk about politics. Whether saying so is a 'contribution to STS', as the session proposal asks us to broach, is relative to the practitioner. But our panel certainly discusses politics on the ground, as it manifests for those in the public faced with technical-political projects. But if we are confused about politics, and the 'we' includes publics and experts too, then this might explain confusions such as political stagnation following upon the heels of broad public participation in energy politics and waste management. Maybe a transformation in modernity is at work, and maybe that explains some of the odd outcomes when the global meets the local and the stakes involve fuel choices and where to place dangerous waste?

Participants:

Don't forget me when I'm gone: siting a radwaste repository the (Canadian) democratic way. *Darrin Durant, York University, Canada*

In the field of radioactive waste management, it used to be that Canada learned from Sweden. Indeed, it has become common to refer to the Swedish solution, a phrase that pays homage to the pioneering work of SKB in Sweden on both deep geological disposal in granitic rock and the relatively successful public consultation program led by SKB. The contemporary situation is witness to either Sweden or Finland poised to be the first to have an approved site and ground being broken on a waste repository, and has SKB plans enjoying a relatively high degree of public trust in Sweden. The Swedish solution appears to be the way to go, if democratic legitimacy is your thing. Canada thought so as early as the 1970's, sending emissaries to Sweden to find out what the Swede's were doing right. One reading of history is thus to say Canada then copied what they saw: trumpet the virtues of deep geological disposal in granitic rock formations, caution that human institutions should not be involved in monitoring post-burial, separate the waste issue from energy politics, and consult the public in some way, such as courting community voluntarism. But times change. Today, Canada appears to be carving out its own way. The Swedish project appears less Swedish per se, and more like a Baltic solution (public and private interests are intertwined in both a Finnish and Swedish repository), and even a European or global one (as those interests might spread the solution far and wide, matching the spread of their energy-related interests). By contrast, Canada's project is squarely national - publicly owned corporations control matters, importing waste is not on the table, and there is no discussion of standardizing technical solutions so they might carry across political borders. But community voluntarism is still central no matter were you go, making it a good test case for what democracy is taken to mean by the bodies charged with managing nuclear waste. Drawing upon interviews with members of Canada-s Nuclear Waste Management Organization (NWMO), public officials, prominent public critics of the NWMO, and document analysis, this presentation shows how the Canadian political discourse of multiculturalism has infused rhetoric about what constitutes the Canadian solution to nuclear waste disposal. In a sense, what does it really mean to 'go local'? The Canadian solution enacts a particular conception of what democracy amounts to or could be. Mapping diversity and difference guides public dialogue activities about siting a repository, which both finds and creates a public multiplicity. Nevertheless, abstract principles are also said to join these island publics, conveniently in a way that endorses elite-generated plans.

In spite of the perceived risks: Analysing acceptance of spent nuclear fuel repository in the Municipality of Eurajoki, Finland. *Tapio Litmanen, University of Jyväskylä, Finland*; *Mika Kari, University of Jyväskylä, Finland*; *Matti Kojo, University of Tampere, Finland*

Many argue that there is no safe way of disposing of high-level radioactive waste. Yet studies reveal a wide discrepancy between the public's perception of the risks associated with a spent nuclear fuel (SNF) repository and the view of the experts. The public tend to fear nuclear technology regardless of how well it is engineered; the radiation risks are perceived qualitatively differently than other risks and strong negative cognitive images are associated with nuclear wastes. Thus local residents, often supported by the general public, have rejected SNF siting attempts time after time and, so far, no country has been able to establish a final waste repository for SNF. The situation in the municipality of Eurajoki is unprecedented. People there have now lived the post site selection phase for a decade, as the site decision was issued in 2000 and final construction licence application is due by 2012. The municipality has given its approval to a repository and to repository expansion plans, and there seems to be little opposition to the project from local residents. At the same time, however, residents also perceive that a repository poses threats to health, safety and well-being. The aim of this presentation is to discuss the views of local residents and their grounds for accepting a repository. Eurajoki and its neighbouring municipalities are the first municipalities in the world where the views of local residents on the construction of a SNF repository have been elicited after the decision of the site selection. A survey was carried out in June 2008. Questionnaires were sent to 3,000 recipients in the area (chosen by stratified sampling). The response rate was 20% and the number of respondents N=606.

Pipeline Lyrics: The Interpretive Flexibility of Energy Pipelines in Southeast Asia and the Caspian Sea. *Benjamin Sovacool, National University of Singapore*

Based on extensive research interviews and field research, this presentation explores the heterogeneity of two large oil and gas pipelines: the $4.6 billion Baku-Tbilisi-Ceyhan (BTC) oil pipeline exporting petroleum from the Caspian Sea near Azerbaijan and then traversing parts of Georgia and Turkey; and parts of the $14.2 billion Trans-ASEAN Gas Pipeline (TAGP) Network connecting the gas reserves of Indonesia, Myanmar, and Thailand with each other and Singapore. Each pipeline is the product of differing interpretations and ideologies, meaning they are "heterogeneous" because their meaning is under constant interpretation. The article depicts four differing interpretive frames for each pipeline, revealing the views of the Association of Southeast Asian Nations, government of Thailand, government of Myanmar, and state-owned energy Malaysian energy company Petronas for the TAGP, and the World Bank Group, British Petroleum, European Union, and the government of Azerbaijan for the BTC. The article finds that pipelines not only mark the physical landscape and distribute energy fuels, they also transfer what were once customary public resources into private hands, concentrate political power, facilitate human rights abuses and possible acts of genocide, become intertwined in national discourses of revitalization and strength, and validate distinct approaches to economic and social development.

"On the Uses and Disadvantages of History" for Radioactive Waste Management. *Jantine Schröder, Belgian Nuclear Research Centre*; *Erik Laes, Flemish Institute for Technological Research, University of Antwerp*

Throughout the nineties, the reality of needing to site a nuclear waste disposal repository led to a change in radioactive waste management (RWM) - from a technocratic, top-down approach to a multidisciplinary, participatory approach. This observation has been the subject of extensive research, with the role of risk perception, participation and trust even 'obvious' by now. What may be perceived as striking is the recurrence of lessons learned in combination with the persistence of confusion and even a sort of stagnation. This situation poses a number of questions: is an 'old' and a 'new' paradigm at work simultaneously? Are the concepts that have become so familiar in contemporary RWM research unable to fit in with the apparently rigid, unswerving conceptual frame that once shaped nuclear reality? The author we chose to investigate this situation was Friedrich Nietzsche, specifically the second part of his "Untimely Meditations", "On the Uses and Disadvantages of History for Life". Nietzsche in this essay repudiates historicism, a movement that makes the present and future dependent on the past. It was this idea that caught our attention in relation to RWM and permanent disposal. Rather than suggest Nietzsche offers a manual to solve the RWM

issue, we used Nietzsche's thoughts with the same general aim as he himself developed them: to tap and sound leading visions, values and ideas. Guided by the central concept of perspectivism, Nietzsche advocates what he calls a genealogy of knowledge, an endeavour that can be said to resemble what is today the philosophical field of historical epistemology. Paraphrasing David Hyder, scientific concepts develop in a particular historical setting, and they are articulated according to prevailing norms and boundaries of rational discourse at the time. However, as time goes on, these same concepts may eventually detach from those contexts. They will carry their norms of use with them, but the constitutive conditions for those concepts, like old scaffolding, may fall away. In this presentation we reactivate the "sedimented" norms and boundaries in which nuclear power and RWM came into existence, restoring the missing context and hidden meanings generative of some current confusions. We focus on the founding and legitimising conceptual framework of modernity. Against this background we shed light on the complexities and confusions of contemporary RWM debates, mainly with regard to the (internationally accepted) geological disposal option for medium- and high-level long-lived radioactive waste. We argue that Nietzsche's 'untimely meditation' may come at a timely moment, i.e. at a time when modernity's way of dealing with waste could be undergoing a major transformation.

Chair:

Darrin Durant, York University, Canada

058. Applying an Engineering Approach to Construct (New) Biology: Investigating Knowledge Production and Artefacts in Synthetic Biology

1:15 to 2:45 pm
5: 514

This session explores how an engineering approach is driving knowledge and artefact production in synthetic biology. Through different case studies and modes of analysis, this panel aims to: * examine synthetic biology against the historical context of previous attempts to take an engineering approach to biology * examine the day-to-day workings of biologists and engineers practising synthetic biology via ethnographic research perspectives * explore knowledge production in synthetic biology, tracing how new synthetic entities are dreamt up and worked into a set of practices and processes that are becoming 'standardised' in this field * examine the resultant synthetic biology artefacts as material objects for ontological study * problematise and explore to what extent 'biology is technology' * consider some of the social and philosophical ramifications of synthetic biology and propose methods of analysis from various STS perspectives * discuss the use of visual methodologies in relation to illustrating a set of thought processes in a team of scientists and engineers Though each paper in this session either draws from different ethnographic case studies or takes a more philosophically-driven STS approach, the session is united in the investigation of how those working to engineer biology create both new biological artefacts and new knowledge. This session makes a clear contribution to a developing line of social and philosophical inquiry around this emerging biotechnology. Proposed Panelists/Chairs (all submitted abstracts): Engineering biology or biologising engineering? Examining contemporary Synthetic Biology in its historical context - Susanna Finlay, BIOS, LSE Following the Production of Ideas and New Biological Forms in the International Genetically Engineered Machine Competition - Caitlin Cockerton, BIOS, LSE Technological biology? A look at some fundamental questions regarding synthetic biological artefacts - Dr. Pablo Schyfter, University of Edinburgh / Stanford University

Participants:

Engineering biology or biologising engineering? Examining contemporary Synthetic Biology in its historical context. *Susanna Claire Finlay, BIOS Centre, London School of Economics and Political Science*

Synthetic Biology is frequently touted as a new endeavour, an emerging hybrid discipline bringing together the strengths of science and engineering to design and build new 'biological machines', and 'synthetic organisms'. While synthetic biology's approach - the attempts at standardising biological parts, the efforts to 'black box' the biology in order to simplify the process of designing and fabricating biological parts, devices and systems, and the endeavours to decouple the process of design from that of the fabrication - sets it apart from the more "biological" approach of "standard" genetic engineering, the application of an engineering approach to biology, and even the name 'synthetic biology', are far from novel. Since the 1860s, scientists and engineers have variously attempted to artificially create life, create artificial life, and understand biology through mathematical models and similarities with physical and mechanical processes and devices. Moritz Traube, and later Stephane Leduc, directed their efforts towards osmosis and the production of 'artificial cells' from inanimate components. Jacques Loeb was at the forefront of early attempts to re-focus biological inquiry around the activity of the engineer, prioritising the production of the new, over analysis of the existent. D'Arcy Wentworth Thompson, Nicholas Rashevsky and Alan Turing all made attempts to bring a mathematical approach to biology by modelling the structure and function of organisms using physics and mathematics. While their efforts are remembered, none heralded the predicted dawning of biology's 'synthetic' age. One of the main barriers to the widespread adoption of a mathematical or engineering biology was the resistance of mainstream biology. On the whole biologists resisted the engineering approach, resented the notion that a science needed to be mathematical, and questioned the utility of overly-simplified mathematical and physical models in the interpretation of complex biological phenomena. Synthetic biology has, therefore, a rich and colourful history and it is against this history that the current paper explores the emerging discipline. Drawing on the findings of an ongoing ethnographic study of a newly established synthetic biology research centre, this paper explores the processes and practices of this latest attempt to apply an engineering approach to biology. Unlike previous attempts, this most recent incarnation of 'synthetic biology' has had more success in engaging biologists. Thus this paper examines the day-to-day workings and interactions of the scientists and engineers constructing this "hybrid discipline". In exploring the social and scientific implications of applying an engineering approach to biology, and equally of applying a biological approach to engineering, this paper examines how synthetic biology both is, and is not, different from previous attempts to engineer life. This paper draws on, and contributes to literature on the social histories of science and engineering as well as the rich body of ethnographies that explore the practices, impacts and implications of science and scientific progress.

Designs on Synthetic Biology. *Alex S Taylor, Microsoft Research*; *David Benque, Royal College of Art*; *Laurel Swan, Royal College of Art*

Drawing on a speculative design tradition, we present work that builds on the emergent, techno-science studies of synthetic biology. Specifically, we describe our use of design interventions to (i) elaborate on the laboratory work of synthetic biologists and, (ii), communicate the aims and results of synthetic biology to wider scientific and non-scientific audiences. Given its short history, synthetic biology has generated a relatively remarkable amount of attention. Its commonalities with genetic engineering have attracted sizeable media interest as well as understandable concern for its ethical, legal and social implications. Also, its involvement in medical bio-tech and such things as molecular, cancer detecting 'computers' have led to some grand claims being made about its contribution to medicine. Moreover, the ambitions of some to open up DNA sequencing (the building blocks for synthetic biology) so that it is commercially available on the Internet regularly provoke the specter of bio-hacking and synthetic life forms run amok. The work we present adopts a speculative design approach to detail some of the more mundane aspects of synthetic biology. Informed by a design tradition that is usually used to provoke and prompt debate, we describe interventions that have been used to draw attention to the workaday rhythms and pace of the laboratory. For instance, one intervention we report on views the

laboratory practices and procedures of synthetic biology through the unusual lens of choreography and sound. The repetitive, almost automatic use of the quintessential tool for wet-lab biologists, the pipette, is augmented with a simple set of sensors and actuators so that it emits musical sounds and lights (Fig. 1). The aim here has been to prompt reflection on the part of the biologists and well as provide an unusual perspective on their routines. A further theme to our work has been to explore communicating the results of synthetic biology to audiences outside the field, but in ways that avoid the hyperbole. We detail one such project, Acoustic Botany, in which the principles of plant synthesis have been applied to the design of an engineered ecosystem where species of plants, insects and animals interact to produce sounds. For example, fruit pods have been designed to pop, vigorously, and a lily engineered with an oscillating membrane to amplify sounds (Fig. 2). This work is currently in preparation for public exhibit. In sum, the motivations of this work are threefold. First, we aim to detail some of the features of synthetic biology. Second, by communicating our work to those in the field, we aim to motivate innovative thinking in synthetic biology, pointing the science towards new approaches to and applications of their work. Third, we hope to reflect on the role design intervention has in science and technology studies. The presented paper will detail the results of our efforts in these areas.

Following the Production of Ideas and New Biological Forms in the International Genetically Engineered Machine Competition. *Caitlin Cockerton, BIOS, London School of Economics and Political Science*

Practitioners in synthetic biology look through an engineer's lens at the incredibly complex, sensitive, reproducing and seemingly endless resources of living material and think about how to build modular, functional, well-characterised biological parts, devices and systems. When the immensity of plant and animal life as well as an array of microorganisms comprises the materials library for this line of work, I ask: how do life scientists and engineers work together to dream up their ideas and then design and build new synthetic biological forms? In 2009, I conducted an ethnography following two teams participating in the International Genetically Engineered Machine competition (iGEM), an undergraduate competition that is arguably one of the most important drivers for the development of synthetic biology as an emerging global bitoechnology. In this research, I paid particular attention to how life science and engineering students learned to think through the 'synthetic biology lens.' Given a number of restrictions set by the competition - such as the necessity that teams use and give back BioBrick parts and follow certain protocols given by the Registry of Standard Biological Parts - there are particular forms through which ideas need to be represented and materials need to generated (e.g. in graphical representations, with mathematical data and in the strict illustration and construction of BioBricks). However, there is also an emphasis on creative 'blue sky' thinking at the core of iGEM ideology owing to, I believe, two key factors: (1) the competition serves as a way to inspire and indoctrinate a next generation of synthetic biologists who will, in the view of the field's pioneers, continue to develop this discipline and ensure its future flourishing; and (2) the competition is an annual source of fresh research ideas that might be taken up and pursued in professional laboratories. Hence, one of the tensions that must be negotiated by these aspiring synthetic biologists involves the presentation of a sufficiently imaginative project that stands out while also staying within the strictly standardised bounds of the engineering-driven synthetic biology view. In this paper, I show how knoweldge production in iGEM, and to a certain extent in synthetic biology more broadly, follows a trajectory wherein ideas are dreamed up creatively, pursued in particular forms of design and construction, re-evaluated or rejected, until eventually a new biological material is made, ideally (though not often) with a certain functionality. One of the primary advantages of ethnographic research is its bottom-up approach that allows a researcher to be surprised by her findings. This is exactly what happened when I began to collect, photograph and analyse 'mind maps' made by the students I was working with. I will present some of this visual data to support my argument and also comment on the methodology that I employed in order to analyse this material. This paper contributes to a recent body of STS literature that focuses on the social study of synthetic biology and also makes a contribution to work in the study of visual cultures in science and technology.

Technological biology? A look at some fundamental questions regarding synthetic biological artefacts. *Pablo Schyfter, University of Edinburgh*

Synthetic biology has captured the attention of scholars in a variety of fields, including those within science and technology studies. Though yet a burgeoning field of research, synthetic biology has inspired studies on the ethical and legal implications of purposefully-constructed, functional organisms; the epistemological uniqueness of a field determined to understand living entities as modular, engineerable objects; and on the challenge to standing dichotomies that distinguish the natural world from that of human artifice. As social scientific and humanistic research on this discipline of biological engineering continues, knowledge on its epistemological and methodological character grows incrementally. I suggest that to understand this discipline in its full scope, researchers must turn to the objects of the field—synthetic biological arteacts—and study them as such—as material objects. I address the physical and ontological 'messiness' of synthetic biological artefacts through an acute, and fundamentally important, question: can we properly understand the material products of synthetic biology to be technological artefacts? Practitioners in the field, employing a consistent technological optic in the study and construction of natural organisms, routinely employ the mantra that 'biology is technology'. I intend to problematize and question this categorization. By employing an established definition of technological artefacts drawn from the philosophy of technology, I explore the appropriateness of attributing to synthetic biological artefacts the four criteria of materiality, intentional design, functionality, and normativity. In doing so, I demonstrate that synthetic biological artefacts do indeed fit within the class of technological artefacts, although they do so imperfectly. Various ontological complications arise from such a categorization, and these are explored throughout the paper. I discuss—for instance—issues related to physical continuity and materiality, temporal continuity and design, teleology and function, and the normative standing of biological artefacts. In doing so, I draw attention to synthetic biology as more than scientific and engineering practice; I argue that the field is equally busied with ontological craftwork. Such a discussion stands to enhance our field's understanding of this newly emerging science and set of technologies. In comprehending the ontological standing of synthetic biological artefacts, as well as the ontological work involved in their production, researchers can gain a necessary perspective to study the manner in which these objects are situated within existing social orders, systems of categorization, and structures of regulation. In analyzing the objects of synthetic biology, it becomes possible to comprehend the ramifications—social and philosophical—of a small but rapidly-growing discipline. Moreover, such a study stands to establish a series of required links between the philosophies of technology and biology—fields whose topics of study and concepts of analysis collapse into each other vis-à-vis synthetic biology.

Presenting Authors:

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Caitlin Cockerton, BIOS, London School of Economics and Political Science

Pablo Schyfter, University of Edinburgh

059. Food and Cultural Contexts

1:15 to 2:45 pm

5: 515

Participants:

The ideal of the 'natural' in the everyday appropriation of foods designed for weight management. *Mari Niva, National Consumer Reseach Centre, Helsinki, Finland*; *Mikko Jauho, National Consumer Reseach Centre, Helsinki, Finland*; *Johanna Mäkelä, National Consumer Reseach Centre, Helsinki, Finland*

Our paper examines weight management practices of people with varying experiences and modes of losing weight. The paper draws on the practice-theoretical idea of appropriation and looks at the meanings, understandings and use of foods designed for weight management in the context of the practices of eating. The concept of appropriation is based on the notion that objects are integrated into everyday lives, domesticated and 'made own' by categorising them, linking them with existing concepts and using them. The paper presents results of a qualitative study in which the participants were recruited from the Consumer Panel maintained by the National Consumer Research Centre. Based on past experiences of dieting, separate groups were organized for those trying to lose weight at the time and for those not. In total 68 people (47 women, 21 men, average age 55) participated in eight focus group discussions in autumn 2009. Five groups were organized for 'weight-losers' and three groups for 'non-weight losers'. The discussions included four themes: 1) what weight management is and why it is so prominent in public discourse, 2) the role of eating and other practices in weight management, 3) an evaluation of the suitability of 20 food products for weight management, and 4) the need for specific 'weight management food products'. The discussions were audio-recorded and transcribed verbatim. The analysis seeks to identify the particular interpretative perspectives that the participants employed when discussing weight management products and their appropriation in everyday life. The preliminary findings of the study suggest that the ideals of weight management foods are based not only on simple measures such as energy, fat and sugar, but also on a complex set of generalized food ideals. These include, in particular, a strong conflict between foods described as healthy, natural and authentic against those depicted as unhealthy, artificial, technological and commercial. It seems that in the process of appropriation, weight management foods are reframed in the context of existing categorisations that may conflict with the scripts assigned by the manufacturers. In the present study, the concept of appropriation is used in the context of food as a special case of the world of objects. Previous research on appropriation has focused primarily on objects in general or on the domestication of lasting commodities such as new technologies that usually occupy a place in homes for years. Food, in contrast, is perishable, it has a short life span, and it is appropriated in a very literal sense by preparing and eating. This makes food an interesting case to study vis-à-vis the concept of appropriation. The study adds knowledge on the ways in which foods designed for weight management get entrenched in the practices of eating, the ways in which existing categorisations resist the embedding of new products, and the ways in which the new products are involved in the shaping and redefining the boundaries of the old categories.

Their beef, our safety: food safety and nationalism in South Korea. *Sana Ho, Dept.Sociology, MSU*

This article examines the arguments and controversy over the beef imports in South Korea. US beef imports were suspended in Korea after the US reported a case of mad cow disease in cattle late 2003. Statements by US officials made it clear that US ratification of a free trade agreement with Korea would not be possible unless the beef ban was lifted. On April 18, 2008, on the eve of Korean President Lee's trip to Washington to meet President Bush, the government ended the ban. After lifting the ban of US beef imports, public discussions and resistances were sparked and expressed in Korea via the internet and also in the form of a TV documentary aired by MBC. In May and June, massive public protests erupted over concerns about the risk of mad cow disease from US beef imports. Candlelight vigils as a form of protest used in 2002 against US military were used again and gave rise to the participation of more people and turned out to the largest demonstration in modern Korean history. These candlelight vigils shows that how a massive protest can be mobilized through the internet. During the candlelight protests, distortions and false information were widely expressed to shock the public and to constantly keep the high level of fear. Also, these protests continue the national identity against the US. Methodology I will use qualitative research methods such as interviews and content analysis of materials on internet and mass media (TV, newspaper) to examine this case study. The contribution to the STS literature This paper will contribute to the STS literature by inputting the analysis in cultural nationalism, ethnicity and social movements.

Your plate or mine? The effects of sharing food on morality, health and consumption. *Charlotte Jacqueline S. De Backer, Ghent University, Belgium*; *Johan Braeckman, Ghent University, Belgium*

Family meals are important moments. They create and maintain bonds, provide a sense of security, and reinforce ethical and cultural values. It has been shown that the regular sharing of food in the family context leads to significantly healthier eating patterns, and correlates positively with academic success and negatively with substance abuse, depression and suicidal risk. Throughout human history, the sharing of food has been a social bonding system, also operating outside the context of family ties. Early modern humans, living in hunter-gatherer societies needed to cooperate for food provision, and the communal meal was a means to share and celebrate the benefits of these acts of cooperation. Food has always been shared based on the principle of (delayed) reciprocal altruism, and our current emotions are still adapted to this principle. The mere sharing of food today often elicits the emotional response to return a favor, or at least have the tendency to do so. Sharing food still is a social bonding system in our modern societies. In the past decades, however, the structural changes in food production, and the pressures of modern life have drastically changed the way we eat. Roughly speaking we can talk about a shift from shared home-cooked family meals to individually catered ready-to-eat meals consumed in front of the television. In the US, the decline in time spent eating together with the family dropped with about 30% from the 1970s up to 2000, as two-income families were starting to become the new norm. It is not that people do not wish to share a meal with others, but time constraints seem to be the limiting factor. And this 'American' trend seems to have made its way to Continental Europe as well, displacing the 'French' way of eating. The (potential) loss of sharing meals may cause an increased state of anxiety and negative psychological well-being, which could affect our health, but also our moral behavior. To explore these ideas we asked respondents to keep a food diary of their eating habits (what they eat and with whom). Using standardized scales, we will additionally measure and compare the psychological wellbeing and moral judgment (Moral Judgment Test) of respondents who have most of their meals alone and people who report to share at least one meal a day with others. This preliminary research is part of an interdisciplinary project on food studies that we plan to launch at Ghent University to investigate the direct impact of eating patterns on (1) morality, (2) diet and health issues, and (3) food consumption patterns in Flanders. This project will be run with participation of the departments of Moral Sciences, Health Studies and Agricultural Economy. We aim to bridge the gap between social sciences and hard sciences, and believe the S4 conference would offer us a great opportunity to launch and discuss our ideas.

Exploitative experiments? Organic farming in Sri Lanka. *Karl Palmås, Chalmers University of Technology*

Current food and ecological crises have given rise to fierce techno-scientific battles over the merits of "green revolution", organic, "integrated", and GM crop-based farming. However, the actual experimenting is often done - and the associated financial risks are often borne - by farmers in the poorer parts of the world. While STS has traditionally studied such techno-scientific

disputes in the context of high-income countries, studies that feature power disparities created by the gap between the richer and poorer countries are less common. What happens when experimentation may involve exploitation? This paper discusses these issues, contextualising them in an ongoing ethnographic study of how various actors (farmers, western social entrepreneurs and aid organisations, agricultural instructors, civil society activists) engage with the issue of organic farming in Sri Lanka.

060. Science, Technology, Ethics, and Policy

1:15 to 2:45 pm

5: 521

Public science and technology funding agencies and research councils respond to and affect three communities: various offices and branches of governments, communities of practicing scientists and engineers, and the larger public. Obligations to each group have become more pressing in recent years, prompting Alan Leshner to characterize the situation in the US as "this new climate of accountability and transparency for science" (Science, 17 April 2009). Of course, the basic situation is not really new. Funding agencies and research councils have always had to be accountable for the public funds they receive and spend. Yet, at least since the passage of the Government Performance and Results Act (GPRA) of 1993 in the US, 'accountability' has meant an increasing focus on demonstrable results. In April of 2005 US Presidential Science Advisor and Director of the Office of Science and Technology Policy John Marburger called for the social science of science policy "to grow up, and in a hurry." At that time he envisioned science policy as "to a great extent a branch of economics" (AAAS speech). His requests for econometric models to help science policy makers make science policy decisions presaged later calls from the Obama Administration for increased openness and accountability to help policymakers and the Administration make budgetary decisions (OSTP-OMB memo M-09-27, OMB memo M-10-01). In large part in response to Marburger's call, the US National Science Foundation (NSF) created the Science of Science and Innovation Policy (SciSIP) Program in 2005. Although the emphasis from science policymakers has clearly been on accountability of agencies to demonstrate returns on investment in terms of innovation and economic growth, members of the community of researchers who are part of the nascent field of the science of science policy argue that to realize its full potential, the SciSIP portfolio needs to include more than economics (see, e.g., the Final Report of the NSF Workshop on Social Organization of Science and Science Policy). The justification for this need is simply that the outcomes of innovation and growth can and have historically been achieved while simultaneously exacerbating problems such as environmental degradation, political instability, stress, and decreased happiness. Thus, even if investments in science can be more effectively translated into an increased economic standard of living, this does not automatically address wider societal concerns. SciSIP Program Director Julia Lane is striving to expand the SciSIP portfolio beyond the field of economics, but thus far relatively few researchers from STS have been funded. This panel seeks to address this difficulty by offering examples of the kinds of contributions STS researchers can make to the science of science policy (including one example of a SciSIP-funded project). Rather than simply presenting interesting arguments and case studies to the STS community, however, this panel aims also to inspire others in STS to bring their expertise to bear of the science of science policy.

Participants:

The Comparative Assessment of Peer Review. *James Britt Holbrook, University of North Texas*

The Comparative Assessment of Peer Review (CAPR) is a three year research project (2008-2011) funded by the US National Science Foundation's Science of Science and Innovation Policy (SciSIP) program. CAPR is studying the peer review processes across 6 US and non-US public science and technology funding agencies, with particular focus on how different agencies attempt to integrate broader societal impacts issues into the review of grant proposals. This presentation will involve two parts: (1) a report on CAPR's research up to this point, which includes the creation of a user-friendly repository of documents related to peer review at each of the agencies involved in the study, interviews with various stakeholders, an online survey, and workshops that integrated the "users" of our research with the researchers; and (2) a critique of CAPR as a case study in how STSish research can contribute to science and technology policy, including recounting some lessons learned (i.e., mistakes) and some strokes of genius (i.e., lucky breaks). Finally, the presentation will discuss some of the ethical issues surrounding the involvement of academics with policymakers, including whether getting one's hands dirty is unavoidable.

Monitoring Environmental Justice: Filling a Gap in Indicators of Sustainable Energy. *Sarah E. Fredericks, Department of Philosophy and Religion Studies, University of North Texas*

Policy makers and citizens alike typically expect that there will be some method of monitoring whether new policies are effective. Indicators, which compile complex data into a simple, easy to understand output, are one such way to monitor policy effectiveness. Gross Domestic Product, (GDP) and the Human Development Index (HDI) are two commonly referenced indicators. While indicators are typically created by economists, policy experts, and increasingly, stakeholders, philosophers and ethicists can contribute meaningfully to indicator creation by analyzing the ways that indicators do or do not align with the explicit and implicit ideals of the groups involved in indicator formation. To demonstrate how ethicists can assist in the process of indicator formation process, this paper will focus on the case of sustainable energy indicators, tools used to monitor the sustainability of a country's energy use according to economic, environmental, and social factors. Though justice is an implicit part of sustainability discussions, sustainable energy indicators rarely include a method of monitoring justice. Environmental justice studies (studies of the ways that certain communities, often people of color and the poor, disproportionally bear the burdens of environmental destruction while having limited abilities to participate in decision making about the environment) will be a significant resource for overcoming this limitation of sustainable energy indicators. Section one will provide a brief overview of sustainable energy indicators, focusing on the Pilot 2006 Environmental Performance Index , the Three Dimensional Index of Sustainable Energy Development, and the energy elements of Prescott-Allen's Wellbeing of Nations. In section two, these sustainable energy indicators will be evaluated according to the ethical priorities embedded in Agenda 21, a blueprint for sustainability of the United Nations, the Earth Charter, a non-governmental document of environmental ethics, and those emphasized by several religious and philosophical ethical positions including that of James A. Nash, a Christian environmental ethicist who draws upon the natural law tradition; Othman Abd-ar-Rhaman Llewelyn, a scholar of Islamic environmental law; and that of Richard Sylvan and David Bennett, scholars who aim to philosophically enrich deep ecology. This analysis will reveal that while discussions of sustainability presume some sort of justice or equity - for future generations and for all present generations - for many philosophical and religious reasons, sustainable energy indictors do not register this concern. Instead, they are constructed at levels of aggregation that mask the disparities between community access to and harm from high-quality energy use. To move toward filling this gap in sustainability indicators, section three will explore existing methods of monitoring environmental justice, noting that they typically focus on a local community or on a single environmental burden such as toxic waste. Section four will identify the theoretical challenges of integrating these focused methods of monitoring environmental justice into indicators of sustainable energy including tensions between data availability and type and differences in scale and will suggest some ways to overcome them.

Leading with Ethics, Aiming for Policy: New Opportunities for Science and Technology Scholars. *Nancy Tuana, Rock Ethics Institute*

I argue that science and technology (S&T) scholars are missing important opportunities to contribute to essential dialogues and make a positive impact on our various communities. From our

own institutions to national and international policy, the insights of S&T scholars have the potential to make important contributions to many arenas, from pedagogy to international policy. I offer the basis for a new model for applied S&T research, in which our work is embedded in scientific and technology research, as well as contributing to policy decisions. I focus on two case studies—research ethics training for scientists and climate change science and policy—and illustrate on the one hand, the value of enlarging the scope of our work and developing a more robust appreciation of the usefulness of the methods of S&T scholars for contributing to answers to important questions such as these and, on the other hand, how working in these areas would not only expand the scope but positively enrich our methods and practices. As I develop the first case study, I argue for the adoption of a greatly enlarged and far more adequate model of research ethics in science and engineering, one to which the contributions of S&T scholars would be essential. In this analysis I introduce an alternative model of the role of ethics in science and technology. While not denying the importance of typical RCR issues, this model not only offers a more adequate model of the ethical literacy needed by scientists and engineers, it also reveals an essential role for S&T scholars to contribute to scholarship and training by identifying the inextricable interconnections of epistemic and ethical issues. My second case study focuses on a new role for S&T scholars in both research design and in science policy. I argue for an embedded role for S&T scholars on research teams. This case study examines how climate models, and in particular integrated assessment models (IAMS), which deal with high levels of uncertainty about future climate impacts, imbed values and assumptions that are ethically and epistemologically salient. Through this example, I illustrate the importance of the role of S&T scholars in identifying key sources of overconfidence imbedded in such IAMS, providing insights on how best to quantify types of uncertainty, helping to critically reevaluate previous studies to help determine when omitting low probability, high impact events can lead to poor decision making, and the like. I argue that this type of transparency would not only lead to better policy-making, but would also be likely to point to reveal significant questions in need of scientific analyses. This example is designed to illustrate the importance of working to ensure that all science, but particularly policy-relevant science, is as transparent as possible concerning embedded values and their intertwined epistemic and ethical import. Furthermore, I argue that S&T scholars need to understand, and perhaps at times even participate in, the policy context so that we can ensure that our work is framed in ways to be of benefit in this arena.

Biocultural Conservation: Identifying Drivers of Biocultural Homogenization in Cultural Landscapes for Socio-Ecological Wellbeing. *Alexandria Poole, Department of Philosophy and Religion Studies, Department of Biological Sciences, Sub-Antarctic Biocultural Conservation Program, University of North Texas*; *Ricardo Rozzi, Omora Ethnobotanical Park Sub-Antarctic Biocultural Conservation Program, Department of Philosophy and Religion Studies, University of North Texas, Institute of Ecology & Biodiversity, Chile*

As of 2008, the technological environment dominated the empirical experience for the majority of humans, with 50% of the world population living in urban environments. Paired with this significant move of humans into the technological environment is the emergence of a global phenomenon that has been identified as biocultural homogenization - the homogenizing of corresponding and interrelated local ecological knowledge, practices, languages, biota and landscapes. Human populations living within urban ecosystems are developing forms of ecological knowledge that are not necessarily tied to regional ecosystems. Instead, urban cultures are shaped by the automated processes of surrounding technological infrastructure, such as transportation infrastructure, industrial agriculture and educational institutions, and the intangible structures that shape life, such as the economic, political, and informational infrastructure. This emerging physical and cultural isolation of society from regional ecosystems might explain the general lack of awareness and ethical concern for the unprecedented loss of biological, linguistic and cultural diversity worldwide. People lose day-to-day relations with the vast diversity of animals, plants, fungi, and the understanding of rural and indigenous communities that co-inhabit other cultural landscapes. Here, we introduce the biocultural conservation approach as a potential dimension to be integrated into planning, development and assessments as a key step towards developing methodologies and indicators that are able to encompass the various components of human and natural systems as well as the complex and dynamic feedbacks between human beings and their environment-including their linguistic and cultural heterogeneity. Further, identifying potential drivers for biocultural homogenization within the political, economic, educational and technological standards that comprise the urban environment will allow for local urban residents and policy makers to evaluate, identify and respond to phenomena and processes that are contributing to the loss and degradation of society and the environment. With the aim of better understanding the biocultural processes of homogenization, and to develop such approaches that might contribute to the conservation of biological and cultural diversity, at the Sub-Antarctic Biocultural Research and Conservation Program coordinated by the University of Magallanes in Chile and the University of North Texas in the USA, we have developed a methodological approach which treats phenomena as biocultural units. This methodology integrates ecological research and environmental ethics into biocultural education and conservation, and has been developed based on theoretical and empirical work at the Omora Ethnobotanical Park (OEP) in the Cape Horn Biosphere Reserve (CHBR). OEP is also a member of the Chilean Long-Term Socio-Ecological (LTSER) research network coordinated by IEB, and the Ibero-American network of biosphere reserves coordinated by UNESCO. We also propose that international LTSER and biosphere reserve networks offer ideal platforms for research, monitoring and conservation because such networks of sites enable research at ecological, cultural, and political local scales, while simultaneously involving these research sites in a global research network. The biocultural approach helps overcome the deep-rooted notion that humans are separate from nature, contributing to a fundamental revision of evaluative practices which prevail in various organizational, institutional and educational structures, keeping this divide so deeply engrained in theory and practice.

Discussant:

Steve Fuller, University of Warwick

061. Syber Space and Science Communication

1:15 to 2:45 pm
5: 522

Participants:

Expertise and Intertextuality in Online Comment Spaces. *Marie-Claire Shanahan, University of Alberta*

The ever growing accessibility of public read/write internet spaces raises questions about the types of interactions that people, both inside and outside science, have with each other and with science texts. One aspect of those interactions is the claiming and attribution of expertise. Conventional boundaries mark those with scientific credentials as experts and those without as non-experts. Collins and Evans (2002) assert, however, that those outside of science have much to contribute to scientific knowledge. They propose a boundary marking those with contributory expertise from those without, regardless of scientific credentials. This includes individuals (e.g., cancer patients) who have developed personal expertise that allows them to contribute to building new knowledge. The study asks: What types of expertise are claimed by commenters and how are those claims made? A second aspect is the interaction with the text of the article and with other commenters. This is examined through an analysis of intertextuality, taken to refer to the integration of and

reference to other texts (both implicit and explicit). Bazerman and Prior (2004) describe several intertextual techniques including: direct and indirect quotation, mentioning a person, evaluating or critiquing a specific statement or opinion, and using recognizable phrasing and terminology. This study asks: What are the primary intertextual sources for commenters? Do commenters claiming different types of expertise use different intertextual resources? This study addresses these questions by examining the public comments section of seven health science-related news articles appearing in a Canadian national newspaper in 2009 (100-700 comments per article). Each comment was classified for explicit claims to scientific or personal expertise as well as for implicit claims to expertise through the use of specialized language. Once classified by expertise type, each comment was examined for intertextual sources, with special attention paid to intertextual connections to the original article and to other posted comments. The findings illustrate a true mixing of scientific and personal expertise exhibited in the comment sections (20-30% of posts were classified as expert, roughly evenly distributed between scientific and personal expertise). For both types of experts, the original newspaper article was used surprisingly infrequently as an intertextual source. Both types of experts used outside sources primarily. Commenters claiming scientific expertise also made significant use of other comments as an intertextual source, frequently quoting aspects with which they agreed or disagreed. This study begins to unravel the complex interactions taking place in online spaces. The lack of intertextuality with the newspapers articles and the significant intertextuality with other commenters (among those claiming scientific expertise) suggests that understanding this aspect of science communication means understanding commenting communities. Traditional transmission-centred frameworks will not be adequate for understanding this type of science communication. References Bazerman, C., & Prior, P. (2004), What writing does and how it does it: An introduction to analyzing texts and textual practices. Mahwah, NJ: Lawrence Erlbaum. Collins, H. M., & Evans, R. (2002). The third wave of science studies: Studies of expertise and experience. Social Studies of Science, 32, 235-296.

A Comparative Study of E-Democracy in Australia and Korea:-Local Government Cross-Country Practices-.

Hye-jung Kang, University of Canberra

The OECD countries are focusing more on 'participation' with ICTs as a new opportunity for democracy development. Many developed countries have now realised the importance of ICTs as a tool of democratic participation in the policy-making process and of the public engagement(Macintosh 2003). Australia and South Korea are in the process of using ICTs to increase citizens' participation and foster interactive connections between government representatives and citizens. Both countries are in particular regarded as leaders on e-government and e-participation (UN 2008). However, Australia and South Korea have quite different patterns of e-democracy. According to the UN survey in 2008, Australia scores highest on the e-information assessment (100/100), on the other hand, Korea has a higher score on the e-decision-making assessment (93.75/100). This means that Australia focuses on providing information such as policies, political missions and upcoming events but Korea focuses on engaging citizens' participation in terms of expressing citizen opinion, providing representative feedback and discussion of public issues. My research aims: to examine and compare current practices of e-democracy in Australia and South Korea, to explore the factors that shape different practices of e-democracy in the two countries and to analyse what can be learned from each country's practice of e-democracy. My research used a qualitative methodology to explore case studies and to understand in-depth the different form and pathways was taken by e-democracy in Australia and South Korea. This presentation will compare and analyse two local government websites: the Future Melbourne Wiki of Melbourne City Council in Australia (www.futuremelbourne.com.au) and the OASIS of Seoul Metropolitan Government in Korea (oasis.seoul.go.kr). Reporting on exploration of the website and interviews with key personnel responsible for their design and implementation, this presentation analyse how Melbourne city and Seoul city are respectively using the internet to engage the public in decision-making processes. Both cases utilize good citizen governance models. However, the wiki and the OASIS showed different online engagement of the public. In addition, mechanisms of control were different in each case. The wiki has mainly managed by the Melbourne city council, but the OASIS in Seoul was mainly operated by citizens. This presentation attempts to account for these differences and to explore strengths and weakness of each approach. References City of Melbourne. (2008). Future Melbourne Wiki-Post Implementation Review-. Collabforge. Macintosh, A. (2003). Promise and problems of e-democracy: Challenges of online citizen engagement. France: OECD Publication Service. OECD/Korea Policy Centre. (2009). Citizens Participation in Policy-Making -Seoul city's OASIS(oasis.seoul.go.kr)-. ISSUE BRIEF PUBLIC GOVERNANCE Shin, M. (2009). New Possibilities of Citizen-Participation with E-Government: The Case of the "OASIS Website" in Seoul United Nations. (2008). UN E-GOVERNMENT SURVEY 2008: From E-Government to Connected Governance. NY: United Nations Publication. Future Melbourne Wiki: http://www.futuremelbourne.com.au OASIS in Seoul: http://oasis.seoul.go.kr

When Reflexivity Strikes back: Public Policy meets Social Science.

Helene Ratner, Copenhagen Business School

Traditionally, the STS literature has focused on the relations between natural science, technology and society. This paper will also investigate the relationship between science and society, however, by exploring how social science knowledge informs public policy. More specifically, it will explore how sociological theory is transformed into modes of reflection when introduced into leadership philosophies in the Danish school system. Characterized by a hyper reflexivity, Danish school leadership philosophies encourage reflection on how complexity, contingency and discourse frame the managerial space. The assumption seems to be that social science can provide new perspectives from which school leaders can observe their leadership practice. Perspectivism, an issue of epistemology in social science, is turned into a resource in school management: just as reflexivity is seen as an academic virtue (Latour 1988; Lynch 2000), it is ditto assumed to make better leaders. The spread of social science knowledge into public policy emerges from a heterogeneous network including public sector MPA programs and private sector consultancy firms. This network offers an opportunity to revisit the relationship between science and policy, between academia and practice. Drawing on ethnographic observations , interviews and document analysis at two schools (2009-2010), the paper will explore how this interest in social science knowledge is played out 'in practice' by asking: what are the effects of this emphasis on reflexivity? How are these sociological theories turned into a resource? How are they translated in this process? In a final discussion, the paper relates these findings to the 'reflexive turn' within STS (e.g. Woolgar 1988). Instead of a venture into epistemology, reflexivity in the empirical material constitutes new hybrid trajectories of knowing, performing and governing public schools. The concept of reflexivity is simultaneously part of the empirical field's self-description while also an STS analytical device. The paper will discuss the premises for producing knowledge when the analytical tools which theory provides for bringing the 'unknown' into view are already being deployed by the 'informants' (Riles 2001). The paper seeks to make the following contributions to STS: *Revisit the ways that knowledge moves between academia and public policy, using social science knowledge rather than natural science as a case *Discuss how social science knowledge informs public policy in the case of school management *Reflect upon how the challenges of communicating 'science' to 'practice' simultaneously mirror and invert the epistemological reflexivity debates of STS in late 1980's Ref. Latour, Bruno. 1988. The politics of explanation: An alternative. In Knowledge and reflexivity: New frontiers in the sociology of knowledge., ed.

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"to my daughter in the far-away city": text messages, email and blogs by Chinese older women. *Elisa Oreglia, UC Berkeley, School of Information*

When discussing the use of new Information and Communication Technologies (ICT) in China, the focus is on young, and usually urban, users: students, white collars, entrepreneurs, and sometimes migrant workers. However, in recent years the number of Internet users who live outside big urban areas has grown rapidly, and ICT have become an important bridge between the city and the countryside. Take for example Mrs Liu: she lives in a small city in Shandong, and her only daughter left home in the late 90s, first to go to university, and then to live in Beijing and Shanghai. Although they always remained in touch through phone calls, they did not see each other more often than once a year. In 2004, Mrs Liu decided to buy herself a desktop computer, because she had heard from her friends' children about new ways to communicate over the internet: email, instant messaging, and video calls. In the next year, she learned by herself, with the help of her friends, and remotely of her daughter, how to send emails, how to chat, and how to use Skype. This paper focuses on the use of ICT by women like Mrs Liu: older women, often living in the countryside, who are left behind by migrating children and often migrating husbands, and who learn to use mobile phones and sometimes the internet, in order to remain in touch with their families. I will present on-going research that is based on in-depth interviews with and participants observation of a group of Chinese women of different socio-economical status, who have all started to use ICT later in life, with the primary goal of remaining in touch with their children, in particular their daughters, and to be part of their lives even if far away. I argue that this 'personal' use of ICT maintains and fosters ties between urban areas and the underdeveloped countryside, and it has an impact on rural women's lives that is as important for the 'development' of the countryside as are the innumerable programs funded by the government for this specific goal. My theoretical frame of reference are historians of gender and technology in China, who have pointed out that ancient technologies such as the 'kang' (a brick platform that serves both as stove and as bed, typically used and maintained by women) were an important means of creating intimacy among women, through 'feminine skills' that were passed down from one generation to another. These "networks of intimacy," as Francesca Bray calls them, still exist, and are particularly important for both women who have migrated from their hometowns and are trying to create a new life in the city, and for their mothers, who are left behind, but not abandoned. If in the past mothers were 'en-skilling' their daughters in the use of the kang (Flitsch 2008), now it's the turn of the daughters, who are fluent in 'modern technologies,' to en-skill their mothers.

062. The Creation of New Human Kinds in Autism Research and Treatment

1:15 to 2:45 pm
5: 523

In recent decades, the autism spectrum has become one of the most powerful modes of understanding and expressing human difference. Like many objects of the human sciences, autism has been subject to considerable shifts: first described by child psychiatrist Leo Kanner in 1943 as a rare condition involving the appearance of profound aloneness among children in upper middle-class families, autism is today associated with a wide array of identifiable problems, most notably in sociality, communication and typical behaviour and is thought to be diagnosable in more than 1% of US children alone. Crucially, there has been a concomitant proliferation of regimes, both mainstream and esoteric, for the treatment and analysis of these disorders. These shifts are due, in part, to social processes initiated by the category itself. Autism is not only an object of scientific and therapeutic practice: it is also a kind of person. More precisely, it is many kinds of people. At least since the introduction of an autism spectrum, autism has referred to a proliferation of variations on a few flexible themes. In the absence of biological markers to anchor the disorder, the spectrum has expanded over time to encompass an ever-widening range of behavioral symptoms - and of persons thus marked. Today, while "autism parents" put therapies to use in ways that stretch the spectrum even further, bioscientists are increasingly scrutinizing brain scans, genetic markers, and environments to link material traces (and absences) to specific behavioral anomalies in an effort to fix the spectrum, or perhaps pieces of it, into place. Such efforts, however, often have the paradoxical effect of generating still more kinds of people - the "enriched risk" mother, the "child with 22q13 Deletion Syndrome" - at times even undermining long-held understandings of how phenotype relates to genotype. Within the STS approach to the objects of the life sciences, there has been a long-standing concern with the making and breaking of diagnostic categories, the kinds of expertise valorized therein, and the resulting possibilities for fashioning both selves and others. We argue that this admixture of biomedical research, sociohistorical processes, and shifting categories is being re-articulated in new ways through the autism spectrum as new objects and kinds of people emerge from, and are enrolled in, the scientific and therapeutic practices associated with it. We approach this task in several ways: investigating the historical emergence of particular forms of expertise, styles of reasoning, and modes of enacting autism; demonstrating ethnographically how autism therapies and epidemiological research blur the boundaries between human bodies and between bodies and their environments; and examining the way human sociality and behavior are materialized through novel laboratory procedures. Offering a kaleidoscopic view of the contemporary constitution of the autism spectrum, this panel considers how autism science and therapy are making possible new relationships, connections, and disjunctions between people, objects, and ideas in early 21st-century social life and bioscience. We show autism producing new grids of intelligibility, new kinds of people, and ultimately redefining where and how we can locate the human.

Participants:

Personhood, sociality and the neurobiology of autism. *Des Fitzgerald, London School of Economics and Political Science*

Within the branch of autism research that focuses on the neurobiology of the disorder, much effort has been given over to the identification of something like a brain-based, or 'imaging' biomarker for autism. This marker would come in the form of a discrete structural or functional area within the human brain that could be identified by widely-available brain-imaging technology and that could also be reliably and consistently correlated with the presence, or future presence, of autism. Among the hopes attached to such a project is the desire for a diagnostic protocol that is earlier, better, more accurate, and more objective than the current reliance on clinicians who make diagnoses on the basis of observation and analysis of a person's behaviour. Within the social study of the life sciences, much has been written about attempts to situate diagnostic categories (and other things) exclusively in the human brain, and about the questions that such a project raises for the personhood and subjectivity of the person diagnosed, as well as the nature of the diagnostic entity itself (see e.g. recent work by Emily Martin, Nikolas Rose and Joseph Dumit). However, the autism spectrum complicates this process as the problems associated with the disorder are so often either defined by, or manifested in, human social relationships themselves. Thus the search for a brain-based biomarker that might supersede the subjective opinion of a watchful clinician (however skilled) might also be seen as an endeavour to render something material, positive and singular from an entity was previously visible only in terms of relationships between people. In this paper, I will argue that such an achievement is only possible through a particular way of articulating and handling the concept/object of 'human sociality' within laboratories that conduct brain-based research on autism - autism is privileged, here, because of the very presumption of a deficit in human sociality inherent to the disorder. Drawing on archival research,

analysis of published papers, and interviews with leading scientific researchers who work on the links between autism and the human brain, I will suggest that this research works with 'the social' in such a way as to not only make new accounts of autistic subjectivity possible, but also to begin to articulate a series of ideas about human personhood in general. And I will argue that as this research begins to create the space for radically new kinds of persons with autism, so too does it articulate a broader account of human personhood, and sociality, for the coming century.

Joint Embodiment, Radical Translation, and "Autism Parents" in the U.S. *Brendan Hart, Sociomedical Sciences, Columbia University*

It has become increasingly common to view and discuss autism as a form of difference, rather than a disorder. Some articulate autistic self-advocates (as they call themselves) have done much to contribute to this shift through autobiographies, radio and television appearances, and speaking tours. These activists are often openly in conflict with parents - especially those of "low-functioning" children with autism - who endorse behavioral therapies to treat autism. While most recent analyses have emphasized the very important role of autistic advocates of "neurodiversity" (Bumiller 2008, Hacking 2009), this paper focuses on parents. It first shows historically how parent activists contributed to establishing this alternative conception of autism, then demonstrates ethnographically how contemporary parents use autism therapies - seemingly at odds with the neurodiversity movement - in order to achieve neurodiverse ends. In doing so, it will contribute an anthropological perspective - focusing on the classically anthropological topics of translation and personhood - to STS discussions of both lay expertise (e.g., Epstein; Rabeharisoa & Callon) and classifications in the human sciences (e.g, Hacking; Bowker & Star). Drawing on archival research concerning 1960s and -70s parent activism in the US and UK, I will first argue that some engaged parent activists established autism parenting as an ethical vocation and infused autism therapies with the problematic of what I am calling radical translation. Rather than an intelligence deficit, they argued, autism involves differences in sensory processing and communication. Parents, thus, must learn the child's "own special language" and become his personal translator. Theirs was not, however, the deep interpretation of psychoanalysis, but rather the day-to-day translation of behaviors and utterances in terms of emotion and intentionality. Through their work, these lay experts transformed the classification itself, making it possible to conceive of a wide-ranging autism spectrum. In fact, this move would be one critical component in a complex process that ultimately brought neurodiversity activists into the spectrum's fold. I will then draw on participant observation among American families of "low-functioning" autistic children to argue that some parents use autism therapies in attempts to constitute their child's full personhood in social interactions. I will discuss two interlinked modes: translation and joint embodiment. Part of the inheritance of the parent activism described above is an ethical imperative for parents to translate the seeming cacophony of "autistic" behaviors in ways that index a complex, if difficult-to-access, subjectivity. In addition to translating, parents engage in forms of joint embodiment as they guide the child verbally, gesturally, and physically through the social world. In this way, they use behavioral therapies to become an instrumental part of the child's "prosthetic environment" (Holmes 1990). In sum, this paper demonstrates how parents advocate both explicitly (through formal channels of activism) and implicitly (through everyday practices of translation and joint embodiment) for the complexity of autistic subjectivities. In so doing, it both reveals a more nuanced story about the rise of the neurodiversity movement and illustrates deep commonalities among seemingly opposed autistic self-advocates and parents of autistic children.

Extension, Connection, and "Enriched Risk" in Research on Gene-Environment Interactions and Autism. *Martine Lappe, University of California, San Francisco*

Within the United States, diagnosed cases of autism spectrum disorders (ASD) have risen from 4-5 in 10,000 in 1966 (Lotter 1966) to 1 in 110 today (CDC 2009), shifting autism from a rare condition to a common diagnosis. This rise in prevalence has become the site of considerable debate in recent years, raising questions about the role of changing diagnostic criteria (Croen et al., 2002; Hertz-Picciotto and Delwiche 2009), increased awareness, and the salience of environmental factors in causing autism (Daniels 2006; Szpir 2006; Schechter and Grether 2008). The unknown source of this rise in cases has placed questions of cause at the center of political, social, and scientific discourses surrounding autism. In an attempt to address these questions, researchers have started to explore the role of gene-environment interactions in the etiology and pathogenesis of autism. This research posits an interaction between environmental factors - such as toxic chemicals, pesticides, and viral or infectious agents - and genetic biomarkers of susceptibility (Hertz-Picciotto et al. 2006). In this paper I first provide background on the emergence of autism epidemiology in the United States. This brief history traces the role of parents of children with autism, government agencies, and the technological and disciplinary shifts within epidemiology in the emergence of gene-environment interaction research on autism today. Within this section, I discuss the ways in which concerns about specific environmental exposures have been extended to encompass the study of gene-environment interactions in autism more broadly. Second, through analysis of documentary materials, research observations, and interviews conducted with autism scientists and participating families I discuss the practices - and social and scientific dimensions - of several prospective "enriched risk" cohort studies. These epidemiological studies follow mothers who have a biological child diagnosed with autism through a subsequent pregnancy, gathering information about the pre-natal and post-partum genetic and environmental factors that may contribute to the development of autism. I argue that the emergence and practice of "enriched risk" cohort studies are assembling new relationships among bodies, environments, autism risk, and diagnosis. Through webs of disciplinary and parent expertise, bodies, exposures, and histories are drawn together and interrogated in ways that are simultaneously extending questions surrounding autism's cause(s) into the womb, out to the world, and through generations. While families are enrolled in these studies to identify both external and biological risk factors for autism, they also interrogate their own personal histories, homes, and behaviors, all the while monitoring their pregnancies and newborn children in relation to new assemblages of (partial and possible) risk knowledge (Kaufman 2010). This paper will discuss the implications of this research for our understandings of the connections between bodies, environments, histories, and (possible) futures, as well as extensions of risk inward, outward, and through time. In particular, I draw on the work of Adele Clarke, Michelle Murphy, Rayna Rapp, and Nikolas Rose to consider the scientific, technological, and gendered dimensions of this phenomenon.

How the growth of the autism spectrum and genetic research has produced new, 'genomically designated' human kinds. *Daniel Navon, Columbia University*

As autism has exploded in caseloads and prominence - becoming a powerful surveillance category of unknown etiology - the search for explanations at a genomic level has become an important field of bioscientific research. As a result, an increasing number of rare genetic variants have been implicated in autism and have thereby become, along with their bearers, the subject of particular regimes of research, treatment and conceptualization. I will argue that this quest for a 'gene-for' autism, though mostly a failure in its own terms, is producing new human kinds that are that are unique in being defined and delineated at the level of the genotype. Most of the dozens of genetic markers implicated in autism both account for only a small fraction of autism spectrum disorder cases and are also found in people who have not been diagnosed with autism, making calls to disaggregate the bloated autism spectrum along

genetic lines far from straightforward. Indeed the genetic markers reported in connection to autism rarely line up with any extant, recognized diagnostic category. Sometimes, however, they come to represent the basis of new diagnostic categories - human kinds whose unifying feature is not necessarily the observable phenotypic qualities of their present or their fate, but the genetic marker itself. A genetic marker - say, 22q13.3 deletion - can become an object of biomedical investigation for its potential to explain a proportion of autism caseloads but go on to rise to an entirely new syndrome that includes by definition all and only bearers of the marker. Thus 22q13.3 microdeletion begins its career as a potential etiology of autism, but today finds itself the referential core of a new syndrome whose membership it rigidly designates: 22q13 Deletion Syndrome. Powerful networks of clinical and social practice have developed around human kinds like 22q13 Deletion Syndrome, even though they may lack the phenotypic coherence to be discoverable even in principle on a clinical basis. Crucially, the discourses and parent-centered networks that characterize these syndromes and scientific-social hybrids powerfully bear the legacy of their connection to autism. My paper will grapple with this previously unreported practice - which I propose we call the 'genomic designation' of human kinds - and discuss both its history and potential for future development. Along the way, I attend to its implications for key concepts in the STS literature, notably Hacking's 'human kinds', Rabinow's 'biosociality', Rose's 'molecular gaze' and Lippman's 'geneticization'. Though around fifty years old, genomic designation has grown in scale and salience in recent years and autism will be shown to be a key aspect of what Foucault would call its 'surface of emergence': it is central in making genomic designation increasingly thinkable and salient as a way of classifying people within a shifting episteme of medical truth. Thus an archaeological analysis of genomic designation helps bring into view how the intersection of autism research, care and advocacy with genomics is giving rise to important new ways of understanding human difference.

The Vanishing Diagnosis of Asperger's Syndrome. *Jennifer Singh, UCSF*

Asperger's syndrome (AS) was first described in 1944 by the Austrian pediatrician Hans Asperger. It was "rediscovered" by Lorna Wing in 1981 and was given legitimacy by the psychiatric community in the Diagnostic and Statistical Manual of Mental Disorders IV- revised edition (DSM-IVR) in 1994 as one of the "pervasive developmental disorders" along with autism, pervasive developmental disorder not otherwise specified (PDD-NOS), and others. AS is described as a mild form of autism involving social and physical awkwardness, which is sometimes, but not always, combined with verbal precocity and intense but limited learning interests. Since the emergence of the Asperger's label, a community of "Aspies" have emerged, many of whom want their strengths to be acknowledged and wish not to be "cured". In 2010, the American Psychiatric Association proposed a draft of the DSM-V, which eliminates the diagnosis of "Asperger's syndrome" to be replaced as a certain level of severity of "Autism Spectrum Disorder". These changes have ignited severe scrutiny among the "Aspie" community and have major implications on identity for people with Asperger's syndrome (AS). Based on interviews with adults with AS and parents of AS children, as well as media coverage of the DSM-V changes, this paper will analyze the implications of the changing diagnosis of Asperger's syndrome. Using grounded theory methods, this paper will specifically analyze three perspectives: 1) adults who grew up without a diagnosis and self identify with AS; 2) young adults with a childhood AS diagnosis; and 3) parents with a child recently diagnosed with AS. Within the context of the vanishing diagnosis of Asperger's syndrome in the DSM-V, this paper will discuss the meaning of the Asperger's diagnosis for each of these groups and discuss the potential implications of eliminating the Asperger label.

Discussant:

Andrew Lakoff, UCSD

063. Medicine and Gender in Global/Local Politics: Session (3) Gender and Medicalized Bodies in Modernity

1:15 to 2:45 pm
5: 524

This panel, Medicine and Gender in Global/Local Politics, is composed of three sessions. Each session examines medical knowledge, technology and/or medical systems from East Asian viewpoints. Based on empirical data concerning medicine, each paper raises issues on body and gender in the context of women's actions, nation, culture and society. Our goal for these sessions is as follows. First, we convey commonalities and diversities among South Korea, Taiwan, and Japan. Comparative study brings new knowledge and interesting questions to research on medicine and gender. Second, we believe that a comparative approach will allow us to reconsider medicine and gender issues as grounded in imperial and colonial history within both global and local contexts. We hope to prompt common understandings and future collaborative projects among presenters and participants of our sessions. In session (3), we will discuss medicalized bodies and gender. First, Azumi Tsuge will present "Social meanings of 'donating' eggs: Changing views about eggs, bodies, and self in medicalized society". Tsuge analyzes interviews with women in a few countries who donated eggs for medical treatments or research and identifies factors underlying these women's motivations and actions. She then considers the similarities and differences of social meanings of egg donation in several countries. Second, Shu-Ching Chang will present "Making a professional nurse: nursing skills and techniques in Taiwan, 1950s-1980s". Modern science, technology, and medical healthcare systems exerted complex influences in post-1950s Taiwan. Accordingly, nursing concepts and practices have changed. This social history of technology study explores how the use of medical technology during the 1950s and 1980s has had an influence on the nursing profession. Third, Kyoko Mimura will present "Innovation or 'humane' communication? - Comparative analysis of how different cultures dealt with pelvic exam discomfort". It is widely recognized that women undergoing pelvic examinations experience a certain degree of discomfort. The research project examines the development and the actual daily use of naishin-dai, which Mimura regards as culturally situated artifact, in current Japanese hospitals and clinics as well as several cities in the world. Based on comparative studies, she points out that dealing with women's discomfort entails a fine balance between close communication between doctor and patient, and the use of technological solutions. Forth, Ling-fang Cheng will present "Gender, Radiology and the Medical Profession in Taiwan". This study focuses on professional users, that is, radiologists and radiologist technicians, and engages the social constructivist tradition and the theoretical framework of "social worlds" to examine the radiology in Taiwan since the 1950s. The paper will concentrate on three aspects: the making of the "structure" of a "radiology-world" in the medical system over a fifty year time span, the interaction between "actor" and "radiology-world", and the interaction between "actors" and "technology". Following the final presentation, Adele E. Clarke will begin the discussion.

Participants:

Making a professional nurse: nursing skills and techniques in Taiwan, 1950s-1980s. *Shu-ching Chang, Department of Medical Humanities and Social Sciences College of Medicine, Chang Gung University*

"Male doctor v.s. female nurse" is a stereotype in the society of medical healthcare in Taiwan. Nursing is considered a female occupation because women take care of their families in the traditional Taiwan's society, besides women own some characteristics such as kind, patient, benevolent, and bearing hardship without complaining. As a result of this, nursing had held the work by the female in Taiwan until 1990s. The social status of nurses is inferior to that of doctors in the medical field. After 1950s, the modern science and technology and the medical healthcare have a mutual influence. Accordingly, nursing concept and practice have also changed. In 1950s, functional nursing was performed in a number of hospitals in Taiwan. The nurses only needed to do the routine work like taking blood pressure, body temperature, and making a bed; they just neglected the needs of their patients. Even the nurses became the assistants of doctors and were not able to obtain any achievement from their work. The technology did not change the role of nursing at that time.

Along with the development of the dialysis technology, the cardiac catheterization technology and the intensive care unit during 1970s and 1980s, these technologies had a strong impact on nursing content and the role of a nurse. In other words, when nursing linked with the medical technology or the medical instrument, nurses also changed their identity. For example, a nurse who could operate the monitoring device, the respirator or ultrasonic, or even who could understand electrocardiogram's data were often given specialized and intelligent image. This study will explore how the use of medical technology during 1950s and 1980s has had an influence on the nursing profession in Taiwan from the perspective of social history of technology, and will then re-negotiate the complex relations between gender and the social status of doctors and nurses in the medical profession.

Gender, Radiology and the Medical Profession in Taiwan. *Ling-fang Cheng, Graduate Insitute of Gender Studies, Kaohaiung Medical University, Taiwan*

This paper is to examine the case of radiology in Taiwan since 1950s in a social constructivist tradition and the theoretical framework of 'social-worlds'. The focus of the study is on the professional users, that is, radiologists and radiologist technicians who study and apply the technology rather than patients who receive the diagnosis and treatment. So the paper would concentrate on three aspects : the first, the making of the "structure" of "radiology-world", that is, to study the process of the professional development of radiology as a specialist specialty in the medical system over the fifty year span. The second, the interaction between "actor" and "radiology-world", that is, to study the application and recruitment process of radiologists and their subjective identities which affected their relations with technology. The third, the interaction between "actors" and "technology", that is to study the ways radiologists learn to master technology, react to it and define their relationships with it. I hope by analyzing these three aspects, we can understand the complex and interwoven relations among history, institution, organization, society, gender and ethnic relations and unique personality in connection with technology.

Innovation or 'humane' communication? - comparative analysis of how discomfort of pelvic exam is dealt with in different cultural settings. *Kyoko Mimura, Graduate school of interdisciplinary gender studies, Ochanomizu University*

It is a fairly well-recognised fact that women undergoing pelvic examination experience certain degree of discomfort, and thus, tremendous efforts have been put into improving the practice of pelvic exam by OB/GYN and other medical staff, patients themselves and also designers of medical furniture. In Japan, much of such efforts took a form of developing naishin-dai, the tables/chairs specifically designed for pelvic exams, assuming that women patients would not want to know what is going on 'under there' and reluctant to have a direct communication with the OB/GYN during exam. On contrary, in the west, a tendency of de-medicalization of the environment for pelvic exams, such as discontinued use of stirrups for regular check-ups, is apparent, provided that women under exams prefer open, transparent and direct communication. Our research project looked into the development and the actual daily usage of naishin-dai's, which thus may be regarded as culturally situated artefact, in current Japanese hospitals/clinics, by conducting semi-structured interviews to manufacturers' personnel, medical practitioners, and women with experiences of naishin-dai's. Then, we expanded our research to find out how women perceived and reasoned the experience of naishin-dai's by conducting small-scale group interviews, while at the same time, gathered information about how pelvic exams were practiced in various cities of the world, namely, Paris, London, California, Taiwan, and Seoul. The data suggest that: 1) automated chairs which elevate, become flat and open up the patient's legs into the lithotomic position are popularly used across Japan, and they are generally received well by medical practitioners, especially nurses/midwives, 2) women's experiences and opinions vary but no particular aversion to automated naishin-dai's are expressed by women who have been on them; 3) similar chairs are used in Taiwan and Seoul, and curtains to block off the sight of patients installed in most of Japanese practices are also in use, but their ideas of environment for pelvic exams seem to be more flexible than those of Japanese clinics', 4) in the west, the primary importance is placed upon thorough communication with patients, and tables/chars are not thought to compensate it, but in some cases, efforts to improve the exam table and its surroundings are observable. There seems to be a fine balance between dealing with women's discomfort by close communication or by technological (hardware) solutions. It is not straightforward to state which is better, because, to a large extent, it depends on how 'discomfort' is perceived and expressed, who attempts to deal with it, and how women are supposed to behave in clinical situation and to new technology. This analysis should provide a new insight into discussions about relationship between women and technology, and also to gender analysis of medical technology.

Social meaning of 'donating eggs: Women's views about eggs, bodies, and self. *Azumi Tsuge, Meijigakuin University*

Using interviews touching upon five different countries, I discuss several parameters of human egg donation and its social meaning. One of these is the legal context: There are some countries which allow legal non-commercial "donation" of human eggs, by women's voluntary consent, for fertility treatments and/or biomedical research. While commercial egg donation is regulated in several countries, some other countries permit commercial trading of eggs, e.g. USA and India. And there are many countries, including Japan, which have no legal regulation of egg selling. An opinion poll shows that many people in Japan not only disapprove of selling eggs but also of donating eggs without compensation. However, it is well-known that some Japanese buy eggs for fertility treatment in the U.S. Interviewing medical doctors and patients in fertility treatment, both in Japan and the U.S., and also Japanese people who act as agents for buying-selling eggs mainly for Japanese 'consumers' in the U.S., I examine how they justify or criticize egg donation. I also identify factors affecting how these people narrate women's motivations and reactions to egg donation either for fertility treatment or biomedical research. In that way I show how the social meaning of 'donating eggs' for fertility treatment is forming in Japan. Next, I compare the narratives concerning egg donation for fertility treatment to the narratives concerning egg donation for biomedical research, I consider the reasons underlying differences and similarities. Furthermore, I address the discussion about whether scientists and medical doctors may use eggs derived from iPS cells in the future. In conclusion, I describe the social meaning of egg donation in Japan focusing as follows: (1)what actions are legitimate or common, (2) family bonds and the concept of how widely "family" extends, (3) the medical systems and doctor-patient relationship, (4) context surrounding people with illness and disability, and (5) gender roles. I discuss the cautious hope for advanced science and consider how the action of donating eggs changes women's views about eggs, bodies, and self in biomedicalized society.

Direct relationship between technology and gender-sexuality view: analyzing transitional phases of industrial structure. *Sakino Takahashi, Tokyo University of Agriculture and Technology*

Relationship between technology and gender has been argued indirectly with intervening factors such as family and hierarchy. Typical argument has been such that change in industrial structure was associated with the change in the family and wage structures, and such change in the family and wage structures had various effects on the gender-sexuality views. If this is the only route of analysis, relation between technology and gender can be analyzed only after the completion of such change in the family and hierarchy structure, and analysis of transitional phase in the industrial structure would be extremely difficult if not impossible. However, gender-sexuality views are diverse and they are closely related to the type of labor people are engaged. Close

examination are, therefore, required. Two periods in Japan are discussed. The first is the period from the interwar period between WWI and WWII to the postwar period when the heavy industry took off. The gender-sexuality view typical for the heavy industry period also evolved in this period. This development is discussed not only with its relation to the heavy industries but also with the surrounding sectors such as mining and textile industries, and in particular, by focusing on the works of labor hygienists and how companies like Hitach and Toyota mobilized female labor from their surrounding coal mine and agricultural workplaces. The second is 1990's to 2005 when the number of people working in the heavy industry declined, and the gender-sexuality view typical for the heavy industry period receded. This receding temporarily gave opportunity for the emergence of various gender-sexuality discourses. However, a new type of deterministic gender-sexuality view seems have set in with the recent settlement of the web-based society. Such gender-sexuality view is formed around the "body" which is closely related to biology and the its surrounding discourse, and many eye-opening descriptions are left in the field of labor hygiene and public health. Use of such literature is enabled by incorporating the approach of the history of biology and medicine. Analyzing situatedness of the technology and the gender-sexuality as well as the process of their co-generation opens up the realm of technobiopolitics, enabling continuous analysis even in the period of techno-industry transition period such as today.

Chair:

Azumi Tsuge, Meijigakuin University

Discussant:

Adele E. Clarke, University of California, San Francisco

064. Toxic Relationships? Science, Community, State in East Asia - the case of Hazardous Pollution & Waste

1:15 to 2:45 pm

5: 531

Toxic Relationships? Science, Community, State in East Asia - the case of Hazardous Pollution & Waste Session Organiser/Discussant: Stephen Healy (UNSW) This session will compare experience of hazardous toxic pollution and waste in Japan and Australia in order to explore the ways that they converge and the ways that they differ. As scenes of controversy such episodes have provided a number of rich STS case studies, some of which focus this session. The session will examine and highlight the ways existing STS theory is adequate to the challenge of making such cross-cultural comparisons and explore ways and means by which the STS analytical repertoire might better cater to such cross-cultural difference. The session will focus upon lay experience of these pollution episodes, the way this experience was informed, both positively and negatively, by science and the regulatory context in which this occurred. The session participants bring expertise on and experience of: (i) Itai- itai disease (Cadmium poisoning) episode in Japan in the 1950s & 1960s (Masanori Kaji, Tokyo Institute of Technology); (ii) Resident antipollution movements in Kawasaki in the 1960s & 1970s (Mayumi Shigematsu, University of Tokyo); (iii) Resident involvement in the management of organochlorine (HCB) pollution and disposal at Botany in Sydney in 1990s- (Paul Brown & Stephen Healy, UNSW); & (iv) Science, Policy and Culture Linkages in Australia's implementation of the Basel Convention, focusing upon Australia's Hazardous Waste Technical Group (Paul Brown). The session will involve three formal papers by Masanori Kaji, Mayumi Shigematsu and Paul Brown (on (i), (ii) and (iv) above) and an analytical overview by Stephen Healy intended to draw out various of the cross-cultural analytical implications in order to facilitate further discussion by session attendees. Session Participants & Contributions: Session Organiser/Discussant: Stephen Healy (UNSW); s.healy@unsw.edu.au Masanori Kaji (Tokyo Institute of Technology), Paper title: "The Role of Expert-Victim Collaboration for Pollution Control in the Case of Itai-itai Disease, a Cadmium Poisoning Disease, in Japan"; mkaji@bekkoame.ne.jp Using the case of Itai-itai disease, a rare case of successful pollution control in Japan, this paper looks at experts' role in technology-related problems and shows the significance of victims' participation and collaboration in solving techno-environmental problems. Mayumi Shigematsu (University of Tokyo), Paper title: "An analysis for research activity by residents - Case study of measurement activity in air pollution area in Japan"; qyq06254@nifty.com The measurement of air pollution by residents in Kawasaki was started in 1967, resulting in a 1982 legal case that was settled by 1999. This study uses interviews and primary documents to analyse the role of specialist's and the relation between these research activities and 'residents' knowledge'. Paul Brown (UNSW), Paper title: "Cautious Traders: the role of science and precaution in global hazardous waste trade"; paul.brown@unsw.edu.au Precaution has been built into Australian waste trade policy through national consultative mechanisms bringing scientists, policy makers and industry traders together since the early 1990s, although it's interpretation remains contentious. This paper follows the history of Australia's implementation of the Basel Convention, to explore science-culture-policy linkages.

Participants:

Cautious Traders: the role of science and precaution in global hazardous waste trade. *Paul Frederick Brown, UNSW*

Cautious Traders: the role of science and precaution in global hazardous waste trade. Paul Brown, History and Philosophy of Science at UNSW Since the early 1990s, the work of building precaution into Australian waste trade policy has proceeded through national consultative mechanisms which bring scientists together with policy makers and industry traders. The interpretation of the precautionary principle remains contentious, even though government has issued practical guidance for traders on waste definition and the meanings of 'hazard' and 'environmentally sound management'. Better harmonisation between jurisdictions, an agreed 'ecocentric' approach, and strengthening of participatory mechanisms are some of the other fundamental requirements, as Australia enacts its obligations under relevant international treaties. This paper follows the history of Australia's implementation of the Basel Convention, to explore science-culture-policy linkages. One focus is the knowledge production processes of Australia's Hazardous Waste Technical Group.

The Role of Expert-Victim Collaboration for Pollution Control in the Case of Itai-itai Disease, a Cadmium Poisoning Disease, in Japan. *Masanori Kaji, Tokyo Institute of Technology*

The Role of Expert-Victim Collaboration for Pollution Control in the Case of Itai-itai Disease, a Cadmium Poisoning Disease, in Japan Masanori Kaji (Tokyo Institute of Technology) Itai-itai disease is a well-known pollution-related disease from 1960s Japan. The disease is characterized by severe pain, so it is called "itai-itai" disease because the Japanese word "itai" means "ouch" or "painful." Itai-itai disease was first identified in Japan soon after World War II, in the Jinzu River basin in the Toyama prefecture in central Japan. A local medical doctor, an agricultural economist and an analytical chemist in collaboration with local farmers in the disease-riddled area, first showed that the disease must be caused by cadmium poisoning and that the source was the nearby Kamioka Mine of the Mitsui Mining & Smelting Co., Ltd., located upstream along the river. Professors from a local university's medical school proved that this disease's victims usually suffered from kidney damage, a characteristic of high cadmium exposure, and often experienced serious bone damage, resulting in brittle bones. They also developed osteomalacia, a disease caused by calcium deficiency that is characterized by a softening of the bones, accompanied by pain and weakness. The victims of Itai-itai disease sued the company in the mid-'60s and won the case in 1972. The company agreed to compensate the victims and treat the contaminated soil. It also signed a pollution control agreement, which allowed victims' groups to enter and inspect the mine and factories at the company's expense and to demand appropriate measures to prevent subsequent pollution. Victims and lawyers, with scientists' cooperation, conducted a complete inspection of the mine every summer beginning in 1972. The 30-year period of continuous inspections and negotiations greatly reduced pollution outflow and improved mining facilities. However, some experts delayed people's understanding of the disease's cause and promoted the mining industry's backlash against victims. Using

the case of Itai-itai disease, a rare case of successful pollution control in Japan, the paper looks at experts' role in technology-related problems and shows the significance of victims' participation and collaboration in solving techno-environmental problems.

An analysis for research activity by residents - Case study of measurement activity in air pollution area in Japan. *Mayumi Shigematsu, The University of Tokyo*

Environmental pollution issues that had been actualized in the 1960's became big social problem from the latter half of the 1960's to the 1970's in Japan. The pollution victims and the residents who confronted the issue organized antipollution movements. The movements moved the states and enterprises, and were a key factor for solving the environmental pollution issues. In my study, I focus on research activities by residents in one of the antipollution movements in Kawasaki, and discuss about the meaning of the research activity from the point of view of STS. By doing some interviews those involved in research activities and examining documents that residents put out, I have analyzed specialist's role to the activity and relation between research activities and 'residents' knowledge'(Wynne 1996). Kawasaki is a manufacturing town placed between Tokyo and Yokohama. Kawasaki is one of the serious areas of air pollution in Japan. When the petrochemical complex operated off the coast of Kawasaki in 1960, pollution (air pollution) intensified, and the health hazard in the southern part of Kawasaki became serious. Pollution patients and residents organized the antipollution movement in the latter half of the 1960's. The trial was brought a case in 1982, and the reconciliation of the country and the enterprises was approved by 1999. The measurement of air pollution by residents in Kawasaki was started in 1967. The activity was carried out by four actors: groups who initiated the activities, groups and individuals who cooperated with measurement activity, centers for measurement, researcher who developed apparatus for measurement. The chemical laboratory in senior high school was one of measurement centers, and many local science teachers and engineers have participated in the activities with residents. This fact shows that the senior high schools have acted as "Science Shop". The data gotten by residents could have described their feelings of air pollution. They made many maps which could know the level of air pollution, and got the validity of their claims in the negotiation. I think their insistence is not based on emotional but on the result of measurement. The resident who has worked on the activity for 40 years said, "When data is collected, maps are consistent with our feeling of air pollution". The resident's sense as a person concerned becomes visible and objective through the measurement. I'll compare this case with the Wynne's and present the results at 4S. In some air polluted area in Japan, research activities have done with scientific profession and residents brought up the present situation of air pollution by using their own data as Kawasaki case. Research activity might be necessary to emerge and express their feelings. So, I maintain that research activity has been carried out with collaboration with residents and scientific professionals, and the activity has had some empowerment of the movements of antipollution. References Wynne, B. 1996:"Misunderstood misunderstandings: social identities and public uptake of science," Irwin, Alan and Wynne, Brian (eds.) Misunderstanding Science? Cambridge University Press, 19-46.

Discussant:
Stephen Healy, UNSW

Presenting Authors:
Paul Frederick Brown, UNSW
Mayumi Shigematsu, The University of Tokyo
Masanori Kaji, Tokyo Institute of Technology

065. Rice science, rice technology and rice societies: materiality in research, knowledge and practice
1:15 to 2:45 pm
5: 532

This panel session will explore rice as an object of research, technology and practice in diverse social, institutional, technical and agro-ecological contexts. At the heart of our discussion will be the materiality of the rice plant. By focusing on a single, globally important organism in settings as different as the laboratory, the greenhouse, the field, the kitchen, the funding proposal and the policy document, the panel aims to explore the way it is transformed physically, genetically and conceptually in time and space. For instance, in a molecular biology laboratory 'rice' might mean a solution of crushed leaf material that becomes meaningful through processing and transcription using various instruments. In a farmer's field the seeds, roots, leaves or panicles of the plant may attract attention at different times during the growing season, depending also on the influence of other organisms, water, soil and various agencies and institutions, such as fertiliser companies or input markets. The contributors to the panel will highlight the materiality of rice in certain kinds of contexts: (1) the (bio)physical environments of rice research, ranging from laboratories and greenhouses to field stations and farms, kitchens and dinner plates; (2) the social, institutional and organisational frameworks that shape rice science and technology, for instance the colonial research and extension service, the global research programme or the local adaptive trial; (3) various geographical and social contexts in Asia. The papers in this session are intended to stimulate a discussion about how different ways of interacting with the rice plant help to influence research strategies, food policies and agricultural practices. We expect to raise questions about the tensions between the universalising norms of science and local variations in practice and between scientific and practical kinds of expertise. By analyzing a variety of contextualised forms of rice, we foresee the emergence of an interesting set of questions about the relationship between STS and anthropology. Anthropology's influence on STS is well known, but how do anthropologically inspired STS studies of scientific environments compare or contrast with anthropological studies of material culture, farmer crop management or other social arrangements? We hope to derive lessons about the contribution STS can make in understanding and explaining the differences social contexts make to the conduct of rice research, the generation of rice technology, the spread of new rice knowledge and the application of new rice cultivation practices.

Participants:

The system of rice intensification: Science, practice, or socio-technical movement? *Dominic B. A. Glover, Technology and Agrarian Development Group, Wageningen University, Netherlands*

The system of rice intensification (SRI) is a novel approach to rice cultivation that is claimed to be both more productive and more ecologically sustainable than conventional methods. These claims have been hotly contested (see Surridge 2004). Despite not receiving a clear stamp of approval from the rice science community, however, SRI has apparently spread widely and rapidly. A vigorous and enthusiastic community of SRI supporters and advocates has emerged. Evidently, the SRI phenomenon has a social reality even if its technical features and claimed advantages are disputed. The scientific controversy over SRI could be interpreted as a conflict between two contending paradigms, one of them based on science and the other rooted in practice; or between two communities of scientific practice, one based in laboratories and research stations, the other on farmers' fields and in their communities. The dispute between these two camps revolves around alternative normative visions of the ideal management regime for rice and the resolution of the controversy appears to hinge on scientific evaluation and measurement. Within alternative systems of knowledge and practice, the rice crop itself and the way it is cultivated are conceptualised in contrasting ways. For example, spatial and temporal variations in farming practice may be regarded as (undesirable) deviations from ideal norms, (desirable) adaptations to local circumstances or (neutral) empirical descriptions of the diversity and fluidity that characterise small-scale farmers' practices. The genetic and physiological characteristics of an ideal rice plant are also conceptualised differently, which has implications for past and present rice-breeding strategies. An alternative reading of the SRI controversy suggests that the dispute itself is sustained partly because both sides focus on the technical components and quantitative outcomes of rice cultivation, neglecting its social

dimensions. An STS-informed socio-technical perspective opens up new possibilities to analyse the emergence and spread of SRI as a distinctive system of technical and social practices that is closely associated with the particular kinds of biophysical, socio-economic and institutional settings within which it has emerged and spread. The paper will thus argue that the SRI phenomenon can usefully be interpreted as a kind of 'socio-technical movement' rather than merely a particular package of technical practices. Such a perspective makes it possible to consider whether the social components (e.g. enthusiasm, skill) and institutional embeddedness (e.g. strengthened community networks) of SRI may play crucial roles in producing its supposedly technical outcomes, such as improved rice yields or greater resource-use efficiency. In adopting the language of 'socio-technical movement' the paper will make links between STS scholarship on social movements and science (e.g. Epstein 1998; Hess 2007; Jamison 2006) and the wider sociological literature on social movements. Epstein, S. (1998) Impure Science Hess, D. J. (2007) Alternative Pathways in Science and Industry Jamison, A. (2006) 'Social Movements and Science: Cultural Appropriations of Cognitive Praxis', Science as Culture Surridge, C. (2004) 'Feast or famine?' Nature

Between science and subsistence: Rice in East Timor. *Chris John Shepherd, Dept. of Anthropology, RSPAS, Australian National University*

Rice in contemporary East Timor is multivalent and presents a rich historical legacy. Introduced to Timor over 500 years ago it has become a key subsistence crop altering agricultural production and consumption regimes. Readily absorbed into cultural and economic practices, rice in particular is deployed in the conduct of social alliances, measures to appease spirits, and, in the past, to meet the tributary demands of colonial masters. In the latter decades of Portuguese rule to 1975, rice was prioritized for agricultural intensification and economic development, particularly in favourable agroecological areas. Timorese populations were moved to provide labour for rice production. In drawing on the production and circulation of agricultural technoscience, especially the science of rice, the Portuguese colonial state sought to fashion from the native peoples a particular kind of peasant subject. The Indonesian invasion in 1975, consolidated a new colonial and military power and led to the intensification of integration-oriented rural development. Indonesian investment in agriculture in the new province (Timor Timur) favoured irrigated rice at the expense of other indigenous (upland) crops. On the most fertile rice growing lands, transmigrants from Java and Bali brought their nominally superior rice cultivation techniques. Given the grossly unequal distribution of privileges between Indonesian immigrants and East Timorese, the latter found themselves displaced and oppressed in a context of political struggle for independence. In postcolonial East Timor, rice has continued to receive great attention, but the social, symbolic and institutional significance of the food crop of rice has diversified. Now well embedded in contemporary post-independence development and policy agendas, rice production is framed variously as "food security" for the poor and as "agricultural modernization" for a new class of dynamic farmers in a progressive market-oriented food production sector. In this paper I explore the story of rice in East Timor from three intersecting perspectives: conventional anthropology, the anthropology of development and applied anthropology. Via the former we know rice as a set of cultural practices. Anthropology of development critiques and analyses rice development in the light of existing farmer practices and technosocial relations, while applied anthropology acts instrumentally to improve rice development interventions. The novelty of the paper is to mix these perspectives while recognizing the methodological, interpretative and sub-disciplinary differences that have kept them separate. My theoretical contribution is to show how anthropologists frame knowledge as they deliberate on the cultural, scientific, and "local knowledge" values of rice production and rice intervention. To the STS (Science and Technology Studies) audience, I clarify anthropological approaches to rural development and their intersection with epistemic communities and offer some thoughts on how and where current issues in STS, including methodological symmetry, relativism, and vocational or political engagement, intersect with various anthropological practices and anthropologically-shaped policies and interventions. I explore these ideas through a particular case study called the Seeds of Life Program. I conclude that it is not always fun to present oneself as a critical ethnographer of development in a context where other actors are intent on establishing the legitimacy of intervention.

Negotiating Technical and Ideological Standards for Agroecological Rice Production in Emerging Markets: the Case of Cambodia. *Hart Nadav Feuer, Center for Development Research, University of Bonn, Germany*

Attended by the waning dominance of the industrial agricultural paradigm coinciding with the opening its borders in the early 1990s, Cambodia has experienced a boom in the production of, and enthusiasm for, natural and organic rice, in addition to other traditional Cambodian agricultural products. Driven largely by NGO projects, natural rice production has inhered elements of many development discourses, including aspects of Fairtrade, empowerment and environmental stewardship. In Cambodia, these efforts have led to higher proportional participation rates by producers and more rapid adoption by consumers than in neighboring countries. However, remaining competitive with industrial agricultural practices inevitably requires an increasing focus on quality standards that are defined externally by equipment and conventions in other countries. For the ecological and social aspects of natural rice to become the central selling point into the future, the production of natural products must achieve minimum (or even high) externally-valid standards. While this would seem to be a clear task, contradictions emerge when competing conventions supported by government, scientists and development actors exert upward and, and often uneven, pressure on standards, making them too strict or unharmonious, and thereby less achievable by the resource-poor farmers who make up the bulk of participating natural producers. In this paper, I primarily scrutinize the Natural Agri-Product (NAP) brand promoted by the Cambodian Center for Study and Development in Agriculture (CEDAC, French acronym) and marketed currently by its new private arm, the CEDAC Enterprise for Social Development (CESDE). My approach is interdisciplinary in nature, with development economics providing a background to primarily ethnographic fieldwork among rice producers, marketers and retailers. Generally, I take a material-semiotic view of the broader sociotechnical landscape in which definitions of and demands on quality, desirability, transparency and technical performance are negotiated (or translated, to use actor-network terminology). For practical reasons, the area of research is constrained to Cambodia's capital, Phnom Penh, and the lowland rice farming provinces neighboring it. In the rapidly evolving Cambodian context, I find that the primary tension lies between the technological regime's (i.e., government officials, the international market, rice millers, traders and retailers) partiality for increasing homogeneity of standards and the social regime's (NGO staff, farmers, and donors) support for a more heterogeneous view of production and distribution. Typically, the former regime supports strict legislation that promotes economies of scale and harmonization with international standards. The latter, speaking primarily on the behalf of small-scale farmers and the domestic market, advocates for more flexibility in production dynamics and for a more diverse view of standardization, in which protocols for sustainability and technical performance can evolve with farmers' preferences, competence and level of organization. I evaluate these tensions on three levels: (1) in the legislative context of the ongoing creation of the Cambodian Organic Agriculture Association (COrAA) standards; (2) in the practical context in which promoters try to differentiate their products meaningfully without running afoul of the standards; and (3) in the semiotic context in which traders and retailers negotiate ways to render

these various qualities and characteristics visible to consumers.

Living with materiality or confronting Asian diversity? The case of iron-biofortified rice research in the Philippines. *Sally Brooks, Institute of Development Studies at the University of Sussex*

In the mid 1990s a group of plant breeders at the Philippines'-based International Rice Research Institute, developing rice varieties for 'problem soils' discovered among their crosses an elite line named IR68144-3B-2-2-3 that was a possible contender for a new programme to develop micronutrient-dense staple crops. This 'serendipitous discovery' was feted as a breakthrough; heralding new generation of crops bred for nutritional traits. By 2003 this initiative had been absorbed into a global, system-wide 'Challenge Programme'; attracting substantial co-funding from a new CGIAR donor - the Bill and Melinda Gates Foundation. By this time, a nine month nutritional trial using the IR68144 material, the first of its kind, was drawing to a close; and the 'proof of concept' secured from this study played an important role in garnering support for a far more ambitious programme of research and development. Five years on, 'biofortification' (as these techniques are now collectively known) was selected as one of fourteen 'best bets' identified by the CGIAR for their strategic value and promise of 'impact at scale'. This paper draws on findings from a multi-sited ethnographic study of international science policy processes in rice biofortification, drawing together STS and policy analysis in the context of the broader political economy of international rice research. It focuses on the ten year period between the discovery of IR68144 and the publication, in 2005, of the findings of the nutritional trial (Haas et al, 2005) that proved so crucial to securing the support necessary to 'scale up' biofortifiation. During this time, IR68144 took on many guises, defined and redefined in relation to different disciplinary, institutional and socio-cultural perspectives. This paper highlights the ways in which different actors responded to the material agency of IR68144; drawing implications for reflexive practice and context responsiveness in a research effort increasingly distant from its projected beneficiaries. Today, the centre of gravity of rice biofortification research is located in a more mobile 'global science' community. This paper shows how an instinctive appreciation of the materiality of rice, in interaction with humans - researchers and their subjects - and other material elements, was a key factor that differentiated the early research practice from that of a new network of scientists attempting to achieve a set of global research targets. Finally, it explores the possibility of a 'middle ground' that might bridge the reflexivity of the former with the structures of the latter and so allow scientists room for manoeuvre to work with the material agency of rice rather than continue the quest to 'confront Asian diversity' (Anderson et al, 1998). References Anderson, R. S., Levy, E. & Morrison, B. M. (1991) Rice Science and Development Politics: Research Strategies and IRRI's Technologies Confront Asian Diversity (1950-1980), Oxford, Clarendon Press. Haas, J. D., Beard, J. L., Murray-Kolb, L. E., Mundo, A. M. d., Felix, A. & Gregorio, G. B. (2005) Iron-Biofortified Rice Improves the Iron Stores of Non-anaemic Filipino Women. Community and International Nutrition, 2823-30.

Technological and Institutional Momentum of the Green Revolution Regime: A Case Study of an Organic Rice Cooperative in Taiwan. *Hsin-Hsing Chen, Graduate Institute for Social Transformation Studies, Shih-Hsin University, Taipei, Taiwan*; *Kuei-Mei Lo, Graduate Institue for Social Transformation Studies, Shih-Hsin University, Taipei, Taiwan*

The notion of "technological momentum" coined by Hughes is often used to analyze how a technology can, seemingly with a life of its own, persist and expand into ever greater scale when more and more resources are committed into one delineated path of development. In the case of rice farming in East Asia, Green-Revolution rice technology often works, or is presumed to work, in tandem with a set of institutional arrangements in favor of a stable and more-or-less equitable rural economy in which smallholding family farms hold a prominent place. In countries such as Taiwan that has undergone successful land reform after WWII, the legacy of the GR is especially tenacious, permeating through various aspects of rural society, especially with regards to a formerly highly-regulated food crop: rice. Against this background, the recent turn to organic farming, which aims at not only environmentally sound agriculture but also increased autonomy in production and distribution for small farmers, runs against many odds in rice, compared to similar endeavors with other crops. This article uses case study of the founding of one of the first organic rice cooperatives to explore the multifaceted legacy of the GR. Fieldwork was conducted with sustained participatory research of one of the authors between 2005 and 2008. It is found that, despite the presence of an enthusiastic and environmentally conscious young generation of farmers interested in eco-friendly and socially desirable way of farming, and despite an equally enthusiastic urban consumer market for organic produce, it is still hard for organic rice farmers to make ends meet. Public agricultural research and extension services built for GR-style agriculture does not provide farmers with varieties suitable for organic cultivation. An existing state of high division of labor in rice farming urges organic farmers to buy a large part of the goods and services necessary for the whole labor process: organic fertilizers, mechanical tilling and harvesting services, seedlings from specialized nursery for specialized mechanical transplanter, etc. Dominant nodes of local politics such as the Farmers' Association and government subsidies funneled through these channels are often dominated by important players in the commodity chain of chemical-dependent rice production. Taiwan was rapidly de-ruralized in the past generation, and what is left of the countryside and agriculture has long been a focus of interest for STS researchers in Taiwan. Two opposite scenarios are often portrayed. One is featured by resourceful small farmers capable of meeting the ever-hostile market with their skills and innovativeness, such as in the case of highly-prized bell apple. (Yang, 2001) The other is dominated by transnational agribusinesses which hold a tight grip on crucial links in the commodity chains, from seed patents to trades in produce, such as in the case of genetically modified maize and soy bean. (Wang, 2006) However, the case of rice provides yet another dimension, one that has much to do with pre-existing public-sector technological and social infrastructure, the Green-Revolution regime built in the Cold-War era that still functions even in a globalized capitalist economy.

Chair:

Harro Maat, Wageningen University

Presenting Authors:

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Chris John Shepherd, Dept. of Anthropology, RSPAS, Australian National University

Hart Nadav Feuer, Center for Development Research, University of Bonn, Germany

Hsin-Hsing Chen, Graduate Institute for Social Transformation Studies, Shih-Hsin University, Taipei, Taiwan

Dominic B. A. Glover, Technology and Agrarian Development Group, Wageningen University, Netherlands

066. Stem cell and reproductive tourism

3:00 to 4:30 pm

12: 1212

This pannel will engage with the phenomena of stem cell and reproductive tourism in the global bioeconomy. Western patients travel to countries such as China and India to receive stem cell treatments that are not proven and licensed in their own countries, while reproductive labourers in the developing countries are being recruited as gamete providers and gestational surrogates for the Western clients. The flow of biological materials across borders raises issues of safety, ethics, equality, and social justice. This gives rise to concerns that the unproven commercial stem cell interventions, which generally lack of scientific transparency and professional accountability, will bring to desperate patients physical and

mental harms. Furthermore, it is argued that fertility outsourcing enables risk transferred to the third party and excludes labourers from legal protection; and that the quality of stem cell lines in laboratories and clinics are not always well controlled by international standardization and regulation. These practices are to a certain extent the result of the states' policies. Besides this, not much attention has been paid to the individuals involved in this process of globalization, such as patients and reproductive labourers. Our panel will focus in particular on the role of individual citizens in bioeconomic development, and the strategies that should be taken to mitigate the need for stem cell tourism. It will contribute both to a broader STS understanding of the scope and implications of stem cell and reproductive tourism, and will further the engagement of STS scholars with the newly emerging issues in the biomedical field.

Participants:

Fertility Outsourcing: Assisted Reproductive Technology and Global Precarious Labour. *Catherine Waldby, Sydney University*

This paper will draw on the field of critical labour studies to analyse the phenomenon of fertility outsourcing. Fertility outsourcing refers to the commercial contracting out of a component of the reproductive biology cycle - the provision of gametes, or the gestation and birth of a child - to a third party in exchange for a fee. A whole highly profitable sector of the bioeconomy, including sperm banks, IVF clinics, and oöcyte brokerage companies, secure these contracts on behalf of their clients, the intending parents, and these negotiations frequently circumvent national regulations by working across borders. An extensive body of anthropological, sociological bioethical and science studies literatures have studied commercial sperm and oöcyte 'donation' (more properly vending) and gestational surrogacy (e.g. Tober, Pollock, Dickenson, Nahman) and a growing literature comments on the phenomenon of reproductive tourism (e.g. Vora, Blyth and Landau). While it is common for anthropological and STS analyses to refer to gamete providers and gestational surrogates in passing as reproductive workers (e.g. Tober, Thompson), their status as workers and the kind of labour involved is never probed. Hence this paper will contribute to this literature by taking the idea of reproductive labour seriously. It will draw on the field of critical labour studies, to consider the extent to which fertility outsourcing resembles other forms of labour outsourcing in different sectors of the economy. In particular it will consider the way outsourcing strategies have played a central role in the post-taylorist restructuring of firms. Outsourcing describes a series of business strategies; subcontracting, the lending out of a discreet component of production to a second party company; the use of market service companies to maintain the workplace, rather than provide them in house; and the systematic casualisation of the workforce, the use of temping, and part-time and hourly rate work contracts. More radically, it also refers to the systematic replacement of labour contracts, which sets out relations between employer and employee, with commercial contracts, which set out relations between a client and a service provider. This last strategy typifies the organisation of the fertility outsourcing business model, which makes extensive use of commercial contracts to subcontract a component of fertility to a third party. As in other areas of business, such contracts enable the transfer of risk to the third party and exclude them from the legal scope of labour protection. Because outsourcing effectively locates the workforce outside the firm, it lends itself to transnational commercial networks, so that the workforce in one national location can become a production resource for a company in another. International outsourcing has become a development model for some emerging economies, notably India, whose government has inserted its population into the global economy through the provision of outsourced IT and call centre services to non-Indian companies. With the success of this model, a parallel sector is emerging in reproductive tourism, with predominantly rural day labourers being recruited as gamete providers and gestational surrogates for both non-resident Indians and 'white' North Americans and Europeans.

Stem Celll Treatments in China, Web 2.0., and the Ethics of Despair. *Haidan Chen, Zhejiang University*; *Herbert Gottweis, University of Vienna*

This paper explores the socio-political and ethical dynamics that emerges when patients seek stem cell treatments in Chinese hospitals. Typically, such patients are defined in the literature and in reports as vulnerable and desperate vicitim type of actors who are not well informed about the uncertain outcomes of the unproven stem cell therapies used to treat them. We have been empirically studying patients who had undergone treatments at Beike Biotech by surveying blogs, forums, facebook, websites, and by interviewing Chinese and Western patients. It seems that the "victimization" perspective on these patients has its limits. While most of the patients we have been contacted seemed to be driven in their motivation to undergo treatment at Beike by a mix of hope, hoplessness, and despair, it seems that these patients constitue a rather well organized and well informed cohort making treatment decisions in a deliberate act of balancing potential benefits with risks. There is neither a substantial lack of information on the patient side, nor are informed consent practices missing in the process of treating these patients. We are arguing that driven by despair and a perspective on life as missing desirable quality, the patients we have studied are experimenting with new configurations in the ethics and politics of stem cell research and therapy.

Stem Cell Tourism and the Global Bioeconomy. *Peter Glasner, ESRC Centre for the Economic and Social Aspects of Genomics, Cardiff University*

This paper explores some key features of the emergent international tissue economy in human embryonic and other stem cell lines. Stem-cell bioscience is but one example of the multiple flows and economies of the new, global bioscience. This movement is accompanied by those who accept the promissory nature of stem cell treatments aimed at therapeutic intervention, regenerative medicine or, increasingly, the accompanying desire to prolong natural life. International tissue economies distribute far more than biological materials alone. Accompanying - in many instances preceding - biological material is the international movement and connectivity of technical standards, moral positions and trust. There are circuits of regulatory regimes, as well as the widespread circulation of personnel and the sharing of laboratory technique. In some areas these flows are in turn implicated in economies of accountability and international regulation, but the regulation of markets in trust and accountability, and the guarantees of the worth of the tissue materials used, are less constrained by systems of international governance. Occasionally, as in China and India, such practices are not well established and even deliberately subverted. The establishment and maintenance of standards, and the standardisation of institutional practices, goes beyond the purely technical practices of cultivating stem-cell lines in a laboratory or clinic. Key sites in the global management of contemporary biomedical platforms are Stem Cell Banks like those in the UK and Spain. Their core banking function, as this paper seeks to demonstrate, is increasingly to provide a global basis for standardization and governance and mitigate the need for stem cell tourism.

Chair:

Catherine Waldby, Sydney University

Discussant:

Klaus Hoeyer, University of Copenhagen

067. Monitering the Environment

3:00 to 4:30 pm

12: 1213

Participants:

Environmental monitoring in Sweden - a system of simulated control. *simon haikola, Department of Technology and Social Change, University of Linkoping, Sweden*

My study concerns environmental monitoring in Sweden and

involves textual analysis of reports, mission statements et cetera, as well as qualitative interviews with people involved in the monitoring and political representatives who are responsible for issuing the general mission orders for the monitoring. The research aims at discerning an operating logic within the monitoring, as regards both systemic functioning - i.e. how the monitoring system operates in practice, and what regulatory authority it wields - as well as the view of the monitoring on behalf of those responsible for it being carried out and the politicians issuing the general environmental objectives. Theoretical foundation for the study comes mainly from two sources: philosopher Jean Baudrillard and STS-scholar Sheila Jasanoff. The relevance of the former is due to the proliferation within the system of environmental monitoring of the simulation as a specific mode of control. The concept of simulacra has specific relevance for this particular field, since it is the control of simulacra that is the directing principle within the system, not an actual control of the real environment, which is found to be beyond the limits of scientific authority, the implication being that the system may well be found to be functioning according to its rationality, while environmental damage due to the release of harmful chemicals continue to ensue. While Baudrillards ontological presuppositions goes well with the general STS ditto, his philosophy of simulated reality is found to be more relevant than most theories within this field, since the object here is the study of a certain logic, and the construction of scientific truth, which is the usual common denominator in STS studies. In combination with Jasanoff it allows for an interesting perspective on the simulacra as a mode of control of that which may indeed be impossible to control. Jasanoff contributes with a terminology for and perspective on risk management as a controlling mechanism. Furthermore, her studies on the scientific authority in the field of risk regulation and different regulatory cultures, serves as helpful tools for the study of the two main environmental regulation-agencies in Sweden. The main argument proposed in the paper is that the environmental monitoring is limited to a short-term perspective, in which only a diminishingly small number of the total amount of man-made substances circulating in the environment is noticed. This is quite far from the view of the monitoring as a kind of safety-net for the chemical society which sometimes is constituted in political propositions. Furthermore, there is a noticeable difference between the two regulatory agencies studied, where the one concerned with observations in the actual environment take a rather pessimistic stance toward the overall effectiveness of the monitoring, whereas the agency devoted exclusively to the modeling of scenarios has a positive attitude toward the possibility of eliminating the worst toxins from the market within a discernible future. However, their view in a larger perspective is also that as long as chemicals are produced, actual control is illusory.

Monitoring for Whom? Case Study of Special Natural Monument Grus japonensis in Kushiro Wetland. *Sakiko Ninomiya, Department of Socio-Cultural Environmental Studies,Graduate School of Frontier Sciences, The University of Tokyo*

Grus japonensis (tancho) was thought to be extinct, but was discovered in 1924 in the Kushiro Wetland of Hokkaido, Japan. The population was subsequently placed under special protection and monitoring was initiated in 1952 when tancho was designated a Special Natural Monument. Monitoring is conducted by local residents, including school children, and plays a strong role in policy formation. The tancho population has increased from 33 in 1952 to 1065 in 2008. Significant changes have accompanied this increase. Local farmers claim that tancho has damaged crops, and tancho has become a bird of contention in the local community. This research employs actor network theory to investigate the science-society interface of the tancho issue. It illustrates that the actor network was significantly transformed after tancho feeding was institutionalized by a government agency. Previously, local farmers voluntarily provided feed-corn to tancho and constructed a large feeding platform using traditional farming skills. After institutionalization, only a few local residents were allowed to feed the birds and only at a fixed time and place. Memories of this transformation strongly shape perceptions of the tancho issue. Local farmers feel that this problem is caused by their (i.e the government) tancho, not ours. This indicates that not only ecological, but also social/institutional, factors are fueling the controversy. Analysis of local perceptions indicates that people engaged in conservation activities frame tancho as an ecologically valuable species as a result of scientific knowledge acquired through institutionalized monitoring. By contrast, local farmers not engaged in conservation categorize individual birds according to the relationship with their everyday experiences. They use the term yatsura [bad guys] to refer to groups of juvenile birds that raid farmland and damage crops throughout the year. In contrast, they use the term uchinotsuru [our home cranes] to describe a pair that returns to the farm area every spring. Through daily conversation and knowledge sharing, the farmers recognize not only the visible, but also their local and historical, features of the birds. These practices of observation and communication point to alternative means of monitoring. Monitoring is primarily discussed in terms of scientific or technical accuracy. The questions typically posed in such a techno-scientific discursive framework, such as how, who, and what, cannot grasp the roots of inevitably socially constructed environmental problems. These questions can be better approached by considering "for whom" monitoring is implemented. Although most locals are positively engaged in monitoring activities, monitoring is not for local farmers. Similar questions should be asked of technical advances in monitoring practice. If monitoring becomes a highly professionalized activity requiring specialized training or dependent on expensive equipment, then it can only be conducted by scientific professionals and controlled by central government. This study confirms that institutionalized and scientific monitoring influences perceptions of environmental issues. It demonstrates that STS studies, combined with actor network analysis and knowledge/cognition analysis, can help to articulate alternative monitoring and governance strategies to solve "our" environmental problem.

Voluntarily monitoring water quality of rivers is significant for high school students. *Toshio HIRAI, Minato High School of OSAKA Prefecture*

It is important for the public to monitor water quality of rivers in order to keep sustainable development. I will tell you about the club activities including studies on the water quality of rivers and conclude that it is significant for future citizens (i.e. high school students) to monitor the water quality of rivers voluntarily. The objective of this study is to provide a useful method for teachers in Science Technology Society (STS) education. My students and I have investigated the river for years. At Kashiwarahigashi high school, where I worked before, we had studied the Yamato River for five years. Now at Minato high school, we have studied the Aji River for one year. The activity is a training to commit themselves in an environmental issue, not a compulsory subject. Every year they voluntarily investigate the water quality, analyze and discuss data, make a report and read the paper. I introduce details of my teaching. We collect the samples from a study site and monitor the water quality using a chemical approach. We mainly use the Aquachek Test Strips made by Environmental Test Systems in the USA. We go to the site with a water quality test kit and draw water from the river with a bucket. We measure the water temperature and get the chemical data, for example, alkalinity as CaCO3, pH, concentrations of nitrite nitrogen, nitrate nitrogen and so on. We then compare the test strip pads to the color chart. Our findings show that the pH increased as the water temperature rose. An increase of the water temperature caused more active photosynthesis of the plants in the river. They consumed more CO2 dissolved in the water. CO2 + H2O   H＋ + HCO3－ This equation indicates that CO2 reacts reversibly with water to form a solution of the weak acid, carbonic acid. A decrease in

concentration of CO2 shifts this equilibrium to the left, as this decrease effects a decrease in concentration of H＋, that is, an increase of the pH. From these results, we conclude that the stronger photosynthesis of the plants in the river caused the increase of the pH in the summer. Part of this work was presented at the 7th Osaka City University International Conference on Chemistry and Education held at OSAKA, Japan in 2005, at the Second Japan-Korea Joint Symposium on Limnology held at OSAKA, Japan in 2005 and so on. High school students voluntarily monitor the water quality not for credits but for genuine concern in the environment. This will encourage their concerns and develop their abilities of gathering data, analyzing, discussing and publishing, essential for STS education. In conclusion, the method of these trainings mentioned above is useful for teachers and also make students good citizens who can be committed to STS issues in future. I am convinced that monitoring the water quality of rivers voluntarily is significant for high school students.

Biological material sharing in research: The case of rain forest resources. *Victor Rodriguez, Twente University*; *Alexandre Antonelli, Institute of Systematic Botany*

The tropical rain forests of Amazonia contain the highest biodiversity found on Earth. Whereas some 110,000 plant species are thought to occur in the entire Neotropical region (i.e. tropical America), Amazonia alone is home to some 45,000 species, most of them occurring nowhere else (Gentry, 1982). This outstanding diversity has since long attracted the attention of the scientific community to study and document Neotropical ecosystems (Antonelli, 2008; Rodriguez and Antonelli, 2009). Increasing investments in ethanol and meat production at the expense of natural devastation in Brazilian Amazonia, in conjunction with the threats posed by climate change, are expected to lead to the extinction of thousands of animal and plant species in the following decades. The scientific expertise required to document the exceedingly rich Amazonian biota is far greater than what is currently available in the country, meaning that Brazil will require massive international efforts in order to assess its biodiversity before most of the current rain forest ecosystems collapse. A biodiversity assessment or taxonomic inventory, resulting in a species checklist, is the first step towards the elaboration of scientific floras and faunas. Biodiversity assessments require the work of especially trained scientists called taxonomists. Of the 4,626 taxonomists currently registered at the World Biodiversity Database (by June 2009), 987 were located in the United States, 232 in Germany, 214 in the United Kingdom and only 198 in Brazil. If half of these taxonomists worked on plants, this would mean that in Brazil (with an estimated 55,000 plant species, according to http://earthtrends.wri.org) each taxonomist would have to be in charge of studying some 560 species. This could be compared to the United Kingdom (~ 1,550 species), where the flora has already been extensively investigated and documented, but still each taxonomist would have to deal with no more than 14 species; a species-per taxonomist rate some 40 times lower than in Brazil. This discrepancy has contributed to many scientists in developed countries to focus their research interests in tropical regions, a situation commonly regarded as beneficial to both parts. Despite the clear need of increased international collaboration of foreign taxonomists in Brazil, the last years have evidenced a much contrasting development of the regulations controlling the access and transfer of biological material from the country in general, and Amazonia in special. These regulations have presumably had a large impact in stopping on-going biodiversity assessments leaded by foreign researchers, as well as hindered the establishment of new projects in the area. For further assessing this problem, this paper aims to answer the following question: to which extent have current governmental regulations hindered biological research in Brazilian Amazonia? References Antonelli, A., 2008. Spatiotemporal evolution of Neotropical organisms: new insights into an old riddle. University of Gothenburg. Gentry, A., 1982. Neotropical floristic diversity: Phytogeographical connections between Central and South America, Pleistocene climatic fluctuations, or an accident of the Andean orogeny? Annals of the Missouri Botanical Garden, 69, 557-593. Rodriguez, V., Antonelli A., 2009, Gaining access to biological material from Brazil for research. Taxon, 58, 1025.

068. Research Cultures

3:00 to 4:30 pm

12: 1214

Participants:

Do Pressures to Publish Increase Scientists' Bias? An Empirical Support from US States Data. *Daniele Fanelli, The University of Edinburgh*

The growing competition and "publish or perish" culture in academia might conflict with the objectivity and integrity of academic research, because it forces scientists to produce "publishable" results at all costs. Papers are less likely to be published and to be cited if they report "negative" results (results that fail to support the tested hypothesis). Therefore, if publication pressures increase scientific bias, the frequency of "positive" results in the literature should be higher in the more competitive and "productive" academic environments. This study verified this hypothesis by measuring the frequency of positive supports for the tested hypothesis in a large random sample of papers from all disciplines with a corresponding author in the US. Papers were significantly more likely to report a positive result if their corresponding authors were in states that, according to NSF data, produced more academic papers with less research funding. The size of this effect increased when controlling for the confounding effect of methodology, discipline and other characteristics of papers that previous research showed to influence the outcome. Although the confounding effect of institutions' prestige could not be excluded (researchers in the more productive universities could be the most clever and successful in their experiments), these results support the hypothesis that competitive academic environments increase not only scientists' productivity but also their bias towards "positive" results. The same phenomenon might be observed in other countries were academic competition and pressures to publish are high.

The scientist in the periphery: Localized conditions for research. *Olof Hallonsten, Lund University*; *Mats Benner, Lund University*; *Daniel Holmberg, Lund University*

The development of the global research system is dual and contradictory - on one hand resource concentration to a few 'hotspots', and on the other expansion and growth in number of practitioners and institutions. The first trend seems to have carried a 'star bias' in science policy; a focus on the 'elite' institutions, fields, groups and individuals. Combined with the increased emphasis on evaluation of impact and so called excellence, this creates an image of modern academic science as only populated by - or only supposed to be populated by - the best and the brightest. However, the growth trend is just as visible and has been just as sanctioned politically, by the expansion of the higher education system and the 'knowledge society'/'knowledge economy' leitmotif in policy which is supposed to apply on the whole society/economy and not merely the 'top'. The 'star bias' is reflected in science studies, which is almost exclusively concerned with the 'elite' and often neglects the 'rest' of the science system, both on institutional and individual level. This paper makes an initial attempt to acknowledge the 'rest' of the scientific community - the non-elite scientists employed by non-elite institutions. Empirically, it is a study of scientists in Swedish universities. Though the Swedish university system is uniform with respect to organizational structure (the universities are public and legally isomorphic) and theoretically is a leveled playing field, there is in practice heavy stratification. Somewhat generalized, there is one group of 'star' or 'elite' universities and one group of 'non-star' institutions. In the latter group the 'new universities' are found, a handful of newly established (1990s) regional institutions for higher

education. To the former belongs the 'old' Swedish universities that are generally large, inclusive and traditional in curricula and organization. Research was not part of the original mission for the 'new universities' and research programs have been set up as complementary activities, on different foundations than the path-dependency of the 'old universities'. Comparing these two types of academic institutions in Sweden on the level of the individual scientists and their groups gives insight to the life of the scientist in the periphery - her role, activities and motivations, as well as the expectations on her and the institutional constraints of her research agenda. Exploring how the basic institutional conditions affect the practice of science and the self-image of the scientist in these two different contexts, this study acknowledges the 'rest' of the scientific community in Sweden, and takes a first step towards a comprehensive understanding of the growing population of scientists that exist outside the 'elite' institutions and 'elite' fields. The aim is also to contribute to bridge higher education studies and STS by exploring institutional factors influencing scientific practice.

069. Traveling Comparisons 2: Life on the Move

3:00 to 4:30 pm

12: 1222

This panel brings the issue of life into the discussion of traveling comparisons by focusing on some new forms of mobility in and around biological knowledge practices. Through case studies that range from pharmacogenomic innovation to robotic animals, these papers will challenge the premise that local biologies and the universal laws of life are, by and large, incompatible. On the contrary, we will argue that it is in the valiant efforts of translating and connecting them through various scientific and technological means that facts and ways of life diverge and interfere with one another. In the past fifteen years, anthropology and STS, at last, seem to opening up their once rigid theoretical frameworks and methodological toolkits to embrace the concept of life - not as something that divides social and natural phenomena, but rather as something that highlights how they relate to and include each other in practice. Interestingly enough, this relatively new concept of life has been emerging out of research activities that follow the movement of living objects: primates on the move from Central-African jungles to North America laboratories; genes traveling between living organisms, political debates and clinical testing sites; or mushrooms that make their way from Chinese forests to the tables of Kyoto epicures - to name just a few well-known examples. What these important pioneering studies have demonstrated to us is that in such moves life becomes a target of and ground for comparison. Lives and life forms are constantly compared (metrically, culturally and experientially) calling for further research that explores the relation between comparative practices and the traveling objects of the life sciences and beyond. Once we take seriously the challenge of accounting for such motion, it reminds us the difficulty of drawing the boundaries between lifeways in the plural and Life as a singular object of the biological sciences. Presenters of this session are not taken back by such difficulties, but attempt to challenge them empirically. In particular, we want to argue that this relatively new mobility of life is generated by practices that accumulate comparisons and contrasts on many levels: between economic and biological values through the harvesting of organs; between human and animal in bringing robots to life; between diabetes and cardiovascular disease by metabolizing drugs; and, between possible climate scenarios in the cross-calibrations of ice cores. In tracing such comparative practices, a complex world opens up itself in which questions of parts and wholes are settled in practice - on the move.

Participants:

From Cure to Governance: a Biopolitical Scene after the Brain Death Controversy in Japan. *Goro Yamazaki, Osaka University*

In this paper, I discuss the social meaning of "organ shortage" after the brain death controversy in Japan. The Japanese organ transplantation law was revised in June 2009. On this occasion, it seemed that people spoke about the number of donations more than ever and paid less attention to the scientific controversy surrounding brain death. Since the first establishment of organ transplantation law in 1997, public interest has apparently changed from its cultural meaning of medical practices to governance by the numbers. The discourse about the shortage of organs plays a bigger part these days. The shortage of organs has been a problem worldwide. Yet the number of organs donated in Japan is extremely small compared to other modern societies including other Asian countries. It sometimes leads to "overseas transplantations", some of which evidently are related to organ sale in, for example, the Philippines and China. The law was revised against the backdrop of these risks involved in this medical practice. In Japan, there has been a considerable controversy about brain death since the 1980s. This has resulted in the law in 1997, which was unique in that it did not define brain death as death. On the one hand, this distinctive law was recognized as being the cause for the shortage of organs, and on the other hand, it has often been said that this law is a good example to emphasize the importance of cultural aspects when discussing the acceptance of science and technology in modern society. Margaret Lock has argued this point in her celebrated works. Today, the law has been revised and brain death is defined as death. This means that, under the recent changes in medical conditions, "cultural uniqueness" is no longer the central reason used to explain the Japanese practice of organ transplantation. It is necessary to analyze how the controversy between science and culture has been overcome in this society during these twelve years before the law was revised. What kinds of criteria have been newly employed to justify the brain death and promotion of donation? By focusing on the changing arguments of justifying organ transplantation, I discuss the biopolitical conjuncture between economy and body. I argue that on the emerging biopolitical scene, organ donation and brain death are interpreted through economic indices. The experience of death is obviously a "total social fact", but it is impossible to ignore new kinds of biopolitics if one wants to understand how the human condition has been reconceptualized in recent medical and legal practices. I also demonstrate that a method of comparison is required in order to try to understand the relationship between scientific discourse and the new economic and biopolitical regime.

Making Comparability and Compatibility: on the Interfaces between Culture and Science in the Process of Engineering and Reception of a Robot in Japan. *Akinori Kubo, Tokyo University*

Comparative studies traditionally based on the idea of cultural difference have more or less been premised on comparison or contrast between scientific and cultural entities. That is, when one can say that the same thing appears as different in each culture, its 'sameness' is ensured by its physical or biological identity as a natural element, while its 'difference' is simultaneously ensured by cultural or social disposal of meanings as artificial elements. In other words, the epistemology of cultural difference was based on the dualistic ontology of the cultural and the natural. Recent studies, by contrast, have argued that activities that consist of making comparisons, nevertheless, variously accompany those of making connections or 'compatibility' (Strathern 1991). Such studies explore the ontological aspects of the activity of comparison, whether as a part of academic method or of social practice in everyday life. Through ethnographic analysis of the process of engineering and reception of the robot 'AIBO', this presentation focuses on these relations between comparability and compatibility which can be seen not only in cultural differences but also in differences between culture and science. AIBO was developed in1993 by a Japanese company and was fist marketed in 1999. It has attracted many people as the first robot designed for everyday life. In process of engineering as well as reception, the Robot has exhibited different cultural and scientific aspects, which could be compared with the other and sometimes indeed contrasted by its designers and users. Such comparability, however, was accompanied by the activities of making connections between scientific and cultural practices, which were in turn eclipsed by apparent comparability. This presentation shows how such circulating relations make a kind of reality which can be reduced to neither a scientific nor a cultural domain. Especially, it

deliberates on the interplay and mutual translations in the interface between the physical and the cultural aspects of owners' daily lives in their relationships with their robots. In terms of STS literature, my arguments are oriented toward exploring the multilateral nature in emergent process of so called 'new technologies', and to suggest perspectives on how to perceive the interconnection of science and culture, through rendering them as comparable and at the same time, compatible.

More than Life, Less than Drugs: Comparing Diabetes Medications and Cardiovascular Risk in Japan. *Gergely Mohacsi, Keio University*

The implications of pharmaceutical innovations for patient advocacy and technological progress along with the hopes and risks they bring forth have been addressed as a major area of tension between scientific, personal and political interests. This paper explores the consequences of such clashing concerns by drawing on current ideas of postplurality within STS and anthropology. How does the body of the diabetic patient - from (thrifty) genes to fat bellies - become an experimental site of technological and social innovation in contemporary Japan? What is at stake when these bodies move across different locations and scales in the comparative practices of epidemiology and genetic research. These are the questions I will pursue through an ethnographic account that revolves around the pharmacogenomic research of adiponectin. Adiponectin is a hormone that was discovered in 1995 immediately drawing the attention of the medical community as the most abundant transcript (mRNA) in fat-cells, although its clinical relevance remained unclear for several years. Molecular biologists in Japan showed that genetic variations are responsible for reduced levels of adiponectin contributing to certain forms of insulin resistance associated with obesity. As these results traveled outside of and between laboratories, their implications have been substantiated by clinical evidence in the European trials of a new class of antidiabetic drugs developed by a Japanese pharmaceutical company. Researchers in Tokyo and Osaka realized from early on that the localization of genetic variations affecting diabetes along ethnic differences had its implications for national agendas of health policy and the global reorganization of the drug market. What is more, these novel relationships were passing through the very genetic linkages under investigation in their diabetes research. Should this intricate interaction between science and industry be understood as a new form of epidemiology? Following Andrew Lakoff's notion of pharmaceutical reason, I argue that the prevention of disease aligns illness entities with drug responses through a cycle of comparative encounters. The enormous effort put into proving (and disproving) that the genetic variation of a chromosome on a chemical element placed under a microscope in Tokyo university lab is the same thing that is studied in European clinical trials or isolated from blood samples that had been donated by Yoruba people in a Nigerian city establishes such things as facts of difference. The analysis of this case study will suggest that genes and lifestyles, publics and scientists, atherosclerosis and diabetes, or men and women interfere with each other in their differences and it is these differences that have to be forged through a standard and universally valid biomedical knowledge (of diabetes). Such comparisons across populations, markets, disciplines and disease entities require and generate a permanent movement between different scales and locations.

Bipolar Comparison: on the Alignment of Circulating Ice Cores. *Martin Skrydstrup, University of Copenhagen*

The Eemian is a period in planet Earths climate history about 130.000 years ago, which is estimated to have been 5 degrees warmer than the present period, thus holding major implications for the projection of future climate scenarios under global warming. Why does this interglacial period projected from Dome Fuji ice cores in Antarctica seem to be much shorter and more stable than what the ice cores from the GRIP drilling in Greenland show us? Departing from this issue in the formation of dissent and consensus in climate science, the paper will consider what might be at stake for a cultural anthropologist in comparing comparisons in climate science. Can the different claims on the nature of ice in Antarctica and Greenland be understood with recourse to different "evidential cultures" or "epistemic cultures"? That would of course be the view from the outside. If we ask the actors themselves they do not conduct "comparisons," but perform what is known as "cross-calibrations" between ice cores. I will ask what the scientists observe and argue about in their efforts to align the Southern hemisphere with the Northern and who has licence to conduct "cross-calibration".

Discussant:

joan Fujimura, university of wisconsin, sociology

070. Research on Research

3:00 to 4:30 pm

13: 1312

Participants:

Successful Interdisciplinary Collaborations: The Contributions of Shared Socio-Emotional-Cognitive Platforms to Interdisciplinary Synthesis. *Kyoko Sato, Harvard University*; *Michele Lamont, Harvard University*; *Veronica Boix Mansilla, Harvard University*

Research is becoming increasingly interdisciplinary today (Brint 2009; Bruce et al 2004; National Academies 2005). Cross-disciplinary dialogues and collaborations have become a key to wide-ranging research areas, from the earth's climate to population genetics. The success of an interdisciplinary group pivots on its capacity to amalgamate disciplinary perspectives to leverage understanding, and much contemporary research takes place through distributed cognition, involving several specialists capable of melding theories, methods, and data from different disciplines (Derry et al 2005). This paper addresses the question: How do participants in interdisciplinary research networks create fertile conditions for exchange, support meaningful dialogue, and provide the social and cognitive scaffold necessary to collaborate and generate intellectual advancements? Available theories concerning interdisciplinary collaborations tend to focus heavily on the cognitive dimension of such interchange. We propose the theoretical construct of "shared socio-emotional-cognitive (SSEC) platforms" to capture a broader set of conditions that enable or impede interdisciplinary collaborations. The paper elaborates on this theoretical concept, which is informed by an extensive empirical study of six research networks supported by three prominent institutions. We have systematically analyzed (1) the information on each network, (2) select academic publications of network participants, (3) the data from observing group events and deliberations; (4) questionnaires collected from network participants; and (5) the data from semi-structured interviews with key participants. Our SSEC platforms contain three key dimensions: the intellectual (cognition); the interactional (interaction, meaning-making, and group styles) and the institutional (the rules, practices and expectations of funding organizations and the academic fields). We describe the characteristics and workings of each dimension and highlight how three dimensions mutually constitute each other in creating SSEC platforms. We demonstrate how our construct differs from two well regarded models for understanding interdisciplinary exchange: "trading zones" proposed by Peter Galison (1997) and "interdisciplinary cultures" proposed by Julie Klein (2010). Galison's model focuses on the intellectual dimension and does not address the significance of certain key aspects of SSEC platforms, such as emerging group identity, development of trust, emotional engagement that underscores the intellectual commitment, and the issues of power, status and identity that shape individual behaviors in the collective enterprises. In SSEC platforms, these aspects are not epiphenomenal, but constitutive of the cognitive dimension of interdisciplinary collaborations. Klein's approach addresses institutional and cultural aspects of interdisciplinary work, but SSEC platforms go further and explicitly illustrate the dynamic relationships among the three key dimensions. In sum, our approach departs from available

accounts of interdisciplinary collaborations in the following two ways. First, integrating multiple - intellectual, interactive and institutional - dimensions, the concept of SSEC platforms more thoroughly addresses the intricate workings of interdisciplinary collaborations than do existing concepts. Second, the framework highlights the fundamental role of emotions, identity, and self preservation in interdisciplinary work. For instance, group identity emerges and strengthens among participants as they narrow down their intellectual objectives, develop interpersonal trust, establish distinct working styles and collectively deal with funding requirements. Our study shows that strong group identity is often an essential element for effective intellectual integration.

Characterizing a Scientific Elite: The Social Characteristics and Publication Habits of the Most Highly Cited Scientists in Environmental Science and Ecology. *John Nathaniel Parker, National Center for Ecological Analysis and Synthesis*

Most scientific publications are authored by a small proportion of researchers, and the majority of citations reference a small pool of articles. Surprisingly, however, little is known about the social characteristics of highly cited scientists, and even less about their publication practices. This is unfortunate as there are important reasons for studying this population. Highly cited scientists wield a disproportionate influence on their fields, their study can enhance our understanding of the systematic inequalities present in science, and their achievements offer benchmarks by which the rest of us can gauge our own career trajectories and successes. This study furthers the research on highly cited scientists by examining the social characteristics, opinions, and publication practices of the .1% most highly cited environmental scientist and ecologists (1981-2003). Data come from two sources. First, we conducted a survey measuring the social characteristics, opinions, and experiences with peer review of the most highly cited in these fields using Thompson ISI's list of highly cited researchers. Second, we mined data from Scopus on these authors' publication patterns and citation history to describe their publication practices. To our knowledge, this is the highest-resolution and most comprehensive dataset on highly cited scientists in any field. Overall, we find that this group of scientists is almost uniformly male, middle-aged and from N. America and Western Europe. However, substantial differences exist in their work habits, laboratory size and structure, patterns of extramural funding, and levels of alcohol consumption. While this group demonstrates substantial agreement in their opinions about the institution of citation, they differ in some respects in their experiences with peer review. We further find substantial variation in their levels of productivity, total number of citations received, and citations per paper. Several relationships were also found to exist between being highly cited and patterns of collaboration, specialization, and article placement strategies. We discuss the implications of our findings using existing research on highly cited scientists and other types of scientific elites.

On the localization of shared citation practices in science: trends and comparisons. *Sjoerd Hardeman, Eindhoven University of Technology*

Contemporary science is a social activity localised in such places as classrooms, laboratories, university offices and conferences. Though localised in specific places, part of science explicitly aims at developing knowledge that is globally applicable. Scientific practice is thus likely to be affected both by the global disciplinary context of scholars as well as the way individual scholars relate to one another in a local context. As of now however little is known as to the specifics of science as both a global and local practice and differences therein accross disciplines. This paper focuses on one particular kind of scientific practice, namely citation. Just as reading practices in science differ from place to place (Livingstone, 2005), so are citation practices it is hypothesized. However, the localization of citation practices is not invariant over time and across disciplines. Over time globalization and the emergence of information and communication technologies are likely to have affected the sharing of practices over larger distances (Cairncross, 1997). In the context of shared citation practices it is thus argued that the impact of geographical proximity in mediating on shared citation practices has decreased. Across disciplines, the extent to which citation practices are shared is subdued to the epistemological content with which the discipline is concerned. Following Bonaccorsi (2008), we argue that the more complex the knowledge base of a discipline the less distributed its citation practices. To address this issue empirically we use publication data as extracted from Scopus Elsevier 1996-2008. The extent to which any two publications share citation practices is measured by the degree of bibliographic coupling between the documents normalized for the number of references occurring in both documents. Geographical proximity between any two documents is measured as the inverse of the distance between author affiliation addresses of the authors listed on the publications. In all we thus propose to assess the localization of shared citation practices as measured by the degree of bibliographic coupling of any two documents determined by the distance separating citing documents. Preliminary results suggest that the role of geographical proximity in mediating shared citation practices, though still apparent, indeed decreases over time and differs vastly across disciplines. References Bonaccorsi, A. (2008). Search regimes and the industrial dynamics of science. Minerva , 46 (3), 285-315. Cairncross, F. (1997). The Death Of Distance: How The Communications Revolution Is Changing Our Lives. Boston: Harvard Business School Press. Livingstone, D. N. (2005). Science, text and space: thoughts on the geography of reading. Transactions of the Institute of British Geographers , 30 (4), 391-401.

Factors Shaping Societal Acceptance of New Technologies: Insights from the Literature. *Nidhi Gupta, Wageningen University*; *Arnout Fischer, Wageningen University*; *Lynn Frewer, Wageningen University*

Understanding societal responses to emerging technologies and their applications is key to optimizing strategic development of science and technology in the future, as well as developing and refining commercialisation strategies associated with specific technological applications. Many technologies in the past have raised controversies, leading to societal rejection of their use. As a consequence, it is important to understand the potential determinants of societal acceptance or rejection of emerging technologies. The results of a systematic literature review focused on describing the determinants of societal acceptance of some of the controversial technologies in the past will be reported. The articles were retrieved through the online database Scopus. In total 297 articles covering 10 different technologies were analysed, and different socio-psychological determinants influencing societal acceptance of these technologies were identified. The regional and temporal trends in social science research investigating the determinants of societal acceptance were also reviewed. Correspondence analysis was used to analyse the relationship between technologies and determinants of their acceptance. The results indicate there has been an increased interest and focus on societal acceptance of new technologies in academia, as demonstrated by a steady growth in number of publications over the years. Sixty percent of the studies indicated the influence of determinants like perceived risk, trust, perceived benefit, knowledge, individual differences and attitude. The results also suggest that research in this area is dominated by activities in Northern America and Europe, but this may be a limitation of the research being conducted only in English language journals. Based on the results, it is recommended that more cross-cultural research needs to be done using the same methodologies in order to make regional comparisons. In addition, future research needs to explore the interrelationships between determinants, particularly those which have emerged as being influential in recent years, such as the relationship between perceived risk and benefit, and other psychological factors such as heuristics and affective responses.

Domesticating the Planets: Arguments and Instruments in the

Development of Planetary Geology. *Matthew Benjamin Shindell, University of California, San Diego Science Studies Program*

Before a robotic geologist could explore Mars, planetary geologists had to overcome three major hurdles. First, they had to redefine geology as a planetary science and not solely a science of the Earth, and argue that geological methods were the proper means of studying the planets. Then, they had to show that geological evidence could be gathered in non-traditional ways (i.e. expanding its methods to include instruments in the "field" that had until then only rarely been used outside of laboratories) and that this evidence could be used to answer geological questions and form geological arguments; related to this, they also had to design the instruments that would be flown and construct the facilities and communities within which the returned data could be analyzed and understood. Finally, they had to argue that these new field methods, as instrumentally enhanced as they were, were not a step back from the achievements of the plate tectonics revolution - that the mapping of planets that did not have active plate tectonics would eventually lead to a comparative science of planetary processes and reunite them with their terrestrial counterparts. How the planetary geologists succeeded in these three areas, and how instruments participated in these successes, is the topic of this paper. It will be addressed in two parts. The first section of the paper will discuss planetary geology's formative years within the United States Geological Survey's (USGS) Astrogeology Branch and NASA research centers, beginning with telescopic and satellite exploration of the Moon and culminating with NASA's Apollo lunar exploration program.The second section of the paper, which is based largely on interviews conducted by the author with planetary geologist Philip Christensen, will address the introduction of a specific type of instrument to planetary geology - the infrared spectrometer. This paper confirms a heterogeneous constructionist view of instruments, within which the instrument is not a simple extension of the senses of the scientist, but part of a social project of perception. In this understanding, the instrument and the practices surrounding it compose what Michael Lynch has described as an 'externalized retina' that "[activates] the perceptible and schematically [processes] it" (Lynch 59). Instruments, in this understanding, are intimately connected with the construction and 'domestication' of the object of study. In this case, they participate in the construction of a lunar and Martian terrain that was worthy of geological study.

15-year Record on the Formation of Bioinformatics Research Community in Genome Science in Japan. *Machiko Itoh, RIKEN Plant Science Center*; *Kazuto Kato, Kyoto University*

One important aim of science and technology policies is to help establishing new research communities based on multiple, existing research fields. As one exemplary case, we report here our survey and interview results on the emergence of bioinformatics community in Japan. In the late 1980s, large-scale data such as genomic sequences were produced in biology research, and computational/mathematical analyses became a necessity. Soon computer scientists and biologists started to collaborate, and the field was called bioinformatics. The Ministry of Education (MOE) in Japan was quick to lead the world; already in 1991, it established the Human Genome Center at The University of Tokyo. The main driving force of the pro-genome science policy was "Kakenhi", the research grant from MOE. It shaped the research community by putting together 70-100 and over 400 principal investigators (PIs) in 1990s and 2000s, respectively. The research community was eager to recruit computer and mathematical scientists, and organized training workshops where the participants self-taught biology and computer science to each other. Computational/mathematical research themes were encouraged as the affirmative program of the grant. As a result, 46 and 20 computer/mathematical scientists (PIs) joined the community during 1991-5 and 1996-9, respectively, and one third of them stayed inside the community after 2000. At least three graduate students in laboratories that quit the community became PIs in bioinformatics later. The community also tried to recruit researchers in social and cultural sciences, but welcomed only a few established professors. Much delayed collaboration between biologists and social scientists in the community is attributable to this initial reluctance. According to the Kakenhi members, the barrier of cross-disciplinary research is the difference in values and visions (e.g. practicality against universality). One effective measure to overcome this difficulty was to raise young investigators who experience both disciplines. Establishing new graduate schools also helped reseachers by esteeming their approach and by providing faculty positions. On the other hand, as the new education system matures, some students in bioinformatics suffer from the lack of solid foundations in biology or computer science. Conclusions: 1) Bioinformatics community in Japan was established by forward-thinking biologists who recruited computer/mathematical scientists into the genome science. 2) After the first governmental action, it took 11 years to start the Japanese Society of Bioinformatics (1999), and 14 years to start graduate courses (2002). 3) Participation of a broad range of academic people, i.e. from graduate students to renowned professors, helped the establishment of the bioinformatics community. 4) Cumulatively, three times more PIs joined the research community than the remained number after 2000. Considering the case for social and cultural sciences, recruiting as many newcomers as possible is not always a waste of time and money. 5) It is important to enforce policies that nurture new research disciplines such as creating new research centers and graduate schools. However, we should not lose respect to already established research areas, especially in education. 6) A better design of interdisciplinary grants is necessary for science and technology policies to recruit already established researchers into new disciplines.

071. Patients and Medical Activism

3:00 to 4:30 pm

13: 1321

Participants:

Immunization, hegemony, and dissent. *Jean-Yves Durand, CRIA / Universidade do Minho (Portugal)*; *Manuela Ivone Cunha, CRIA / Universidade do Minho*

Already an old biotechnology, vaccination has been studied by historians of medicine interested mostly in the controversies that accompanied the progression of its global hegemony. Nowadays, extremely few people worldwide are not confronted, at some point in their life, with state-imposed (or sponsored) vaccination of themselves or of their children against a seemingly ever-growing range of vectors of medical insecurity. Often regarded as the ultimate solution for a range of public health problems, the principle of universal vaccination has nonetheless been destabilised in recent years as a result of a changing public engagement with immunization. In Western societies, the dominant views on immunisation are refused only by small groups of proponents of alternative immunological theories and therapeutic systems or by adepts of specific religious views. Despite common perceptions that tend to associate non-vaccination with "exotic" locations and incomplete scientific rationality, there have been phenomena of vaccine uptake decline which are at odds with the evolutionary overtones of this framework of understanding. Far from being a residual anachronism deemed to fade away, the emergence of non-vaccination practices is part of wider social transformations that accommodate what appears to be notions of personalised immunity, which are thus set in contrast with the principle of universal vaccination. These recent, fast evolutions shape contexts that are in need for an ethnographic attention, and especially so since the actual social life of vaccination has motivated surprisingly few ethnographies (and even less comparatist approaches), at least in so far as Western societies are concerned. It is thus our objective to identify the scope of variation in immunization practices and perceptions by

developing ethnographic research in a number of settings in France and in Portugal, two countries with different vaccination histories and public engagement with scientific expertise. These settings are diversified along lines of region, ethnicity, health and dietary systems, and involve different actors of immunization practices and representations (users from different social and professional milieus, civic associations and grassroots movements, frontline health care providers, and scientific networks). This diversification does not aspire to express statistical representativity, but to identify the key themes that bear upon the acceptability of vaccination as they emerge in different publics. It is intended to characterise the forms and to understand the meanings taken by non vaccination practices by generating context-specific insights that are be drawn together in comparative analysis. Immunological theory activates basic dichotomies such as inside / outside, native / alien, us / them. As the recent HPV and H1N1 controversies have once again shown, it epitomizes the tension between individual freedom and collective security (with limits extending well beyond that of the State). Our findings focus on how, especially when faced with a crisis situation, individuals negotiate between more or less educated consent, deliberate dissent, or the passive acceptance of the norm.

Network Patient Research Partners in rheumatology. *Janneke Elberse, Athena Insitute, Free University Amsterdam*; *Jacqueline Broerse, Free University Amsterdam*; *Maarten de Wit, External representative, Dutch Arthritis Patients' League, Amersfoort, The Netherlands*

The Dutch 'Network Patient Research Partners' started three years ago with the objective to involve people with a rheumatologic disease as partners in health research. Twenty-four Patient Research Partners (PRP's) were trained to articulate and integrate their experiential knowledge in a research setting. In couples, the PRP's were matched with one or more research projects, forming a partnership with the researcher(s) in charge. Currently, four university medical centers are involved in the network with 29 research projects in total. The aim of this paper is to provide insight into the enabling and failure factors for effective partnerships between patients and researchers by describing (1) the PRPs' experiences regarding their role in the partnership with researchers and (2) the researchers' perspective on the active involvement of patient research partners in their research project. A responsive monitoring and evaluation method is used. Interviews with researchers and PRPs are conducted and meetings of PRPs and researchers are attended. Notes and reports of meetings, as well as other documents were analyzed. Preliminary findings indicate that experiences from PRP's and researchers vary over research projects. Some research projects seem more suitable for PRP's engagement, for example due to the phase the project is in or due to the nature of the research topic. An important enabling factor is the presence of people who are willing to take initiatives or to make an effort to stimulate collaboration. Some of the PRP's as well as some of the researchers took up this role of so-called driver. The partnership is perceived as more successful if a driver is involved. In addition, an open-minded attitude was experienced as an enabling factor. When researchers were open-minded to the input of the PRP's and willing to discuss the project, the partnership was often perceived as effective. Mutual uncertainty about the role of the PRP in the partnership was perceived as a failure factor. PRP's expectations in this respect were often too ambitious. On the other hand some researchers expected the PRP's to take the initiative in the partnership. Most PRP's and researchers experienced the partnership as a learning process. The nature of the present partnership was new for almost all participants and it took therefore time to create an effective partnership with useful tasks for PRP's and effective ways for collaboration and communication. The PRP's considered training essential in order to fulfill their role. Guidance from the network to facilitate the learning process was considered essential to both actors. Some PRP's felt insufficiently supported by the network in this respect. The researchers on the other hand, felt that the network was not sufficiently embedded in the current rheumatologic research structure and organization. This present research contributes tot STS literature in the area of public engagement and more specifically in the area of patient involvement in research. Currently, there is a growing interest for active patient involvement in research. However, there is a lack of knowledge on how to create effective partnerships, and how to make optimal use of possible complementary knowledge.

Patient Organisations and Consumer Health Organisations in an era of Techno-Citizenship. *Anni Dugdale, University of Canberra*

New modes of governing are emerging where the state is no longer directly providing the services, nor the sole agency contributing to regulation. These modes of 'governing at a distance' provide new limits and opportunities for civil society organisations. This theme is explored in a study of Patient and Consumer Health Organisations. How are such civil society agencies responding to transformations of governance in the health arena? From a study of one Australian jurisdiction, this presentation explores the different forms and strategies utilised by Patient and Consumer Health Organisations to shape the 'immutable mobiles' that enable the governing of health at a distance. What are the terms and conditions under which Patient and Consumer Health Organisations are increasingly able to mobilise citizen perspectives and insert them into standards, health technologies, and other modes of governing the health conduct of both citizens and health service providers? What are the techniques for making patient knowledge robust? To what extent do Patient and Health Consumer Organisations partner or contest health experts and their professional organisations, or hospital and health service managers? What challenges and tensions do they face and how do they manage them as they negotiate their position in complex networks of actors? How do they mobilise their constituencies, keep them engaged and constitute themselves as legitimately representative of key stakeholders? This presentation compares some of the different modes of mobilisation, activism and participation adopted by Patient and Consumer Health Organisations in the Australian Capital Territory (ACT). The ACT Government shares with the other Australian states the complexities of governing health in a divided system where responsibility for health services is shared across public and private sectors and across all three levels of government. Globally, there are policy movements spreading participatory design and participatory policy making tools as the answer to problems of governance in the 21st century; one such problem being identified is the aging demographic profile of OECD countries and the rapid rise in health care costs that this is triggering. Patient and Consumer Health Organisations are being looked to by governments as co-designers of future health services so as to maximise community provision of (free) health care and support thereby minimising demands on tax funded health services. This presentation reports on the alignments, misalignments, symmetries and asymmetries as governments and civil society organisations transform their practices away from forms of welfare state health governance towards the politics and governance of inclusion. The focus is not on the global or the big transformations in governing, but on the local assemblages and local technologies instantiating a new governance and the integration of Patient and Consumer health Organisation within them.

Patient participation in the practices of the pharmaceutical industry. *Jacqueline Broerse, Free University Amsterdam*; *Janneke Elberse, Athena Insitute, Free University Amsterdam*

Patient participation in health research refers to the phenomenon that patients are actively involved in health research. Among various organizations (funding agencies, patient organizations and to some extent research organizations) there is a growing interest in patient participation. However, pharmaceutical companies seem to lag behind. In the present study, we investigate to what extend and in what way patients are currently

involved in the research conducted by pharmaceutical companies, how pharmaceutical companies perceive a more active involvement of patients and what barriers they perceive that may constrain a increasing involvement. Twenty-one semi-structured interviews are conducted with medical directors (11) and representatives (10) of pharmaceutical companies. In addition, four discussion meetings on patient participation organized by (umbrella organizations for) pharmaceutical companies, are attended. The interviews and meetings provide insight in the current situation and possibilities and constraints for future patient participation. In order to analyze the current level of involvement, Arnstein's model of citizen participation is used, which was adapted to patient involvement in research. The model distinguishes seven levels of participation: subject of study - information provider - advisor - reviewer - co-researcher - initiator. In most pharmaceutical companies patient participation appears exclusively to take place at the lowest level: subject of study. Some indicate however that patients are involved on a higher level: for recruitment and providing information. After explaining the interviewees the concept of patient participation into more detail, most interviewees indicate that patient participation could be beneficial for their practices. Possibilities are seen on the level of information provider or advisor. The data shows that there are various barriers to reach a higher level of involvement: a)lack of awareness of possibilities for patient participation, b)satisfaction with the current situation, not need for change, c)lack of best practice examples, d)rules and regulation dealing with contact between pharmaceutical companies and patients and e) local companies hardly have an influence on policies of the mother company. Also the organization of patients was mentioned as a potential barrier: a)do active, representative patient organizations exist which are willing to cooperate? and b)patients were perceived as having a negative image about pharmaceutical companies. We can conclude that patient participation in the practises of pharmaceutical companies occurs at very low levels of involvement, as subject of study, without providing inputs nor having any influence. However, when confronted with the issue of more active involvement of patients, most interviewees do see a potential benefit for a more active role of patients in health research, such as better recruitment and an improved relationship with patients. At the same time the perceived barriers are likely to constrain the realization of a more active involvement of patients in the research practices of pharmaceutical companies. This research contributes to STS literature in the area of public involvement in science. Currently, pharmaceutical companies operate at the intersection of medical expertise, commercial interest and (governmental) regulations. Active involvement of patients will add a new dimension which could be beneficial for both patients and pharmaceutical companies.

Patient satisfaction and the market model of medicine as a form of medical professionalism. *Diego Llovet, The Culture of Cities Centre and York University*

For most of the 20th Century, medical practitioners in industrialized nations favored the idea that patients had neither the knowledge nor the disposition to make decisions pertaining to their own healthcare and that 'good patients' simply followed doctors' orders. Over the years, however, physicians found that this ideal of the passive, voiceless patient was not without difficulty: doctors soon realized that their 'docile' and 'acquiescent' patients often did not trust them, did not comply with their prescriptions and in some cases even took legal action against them via malpractice suits. Understanding the need to rethink the structure of the doctor-patient relationship along new lines, medical practitioners and policy-makers in industrialized nations began to adopt critiques advanced by patients and civil society groups that decried medicine's paternalistic, dehumanizing and authoritarian ways and called for reform. Medicine's institutional rhetoric of care thus changed: the patient is not just a diseased body that can be treated objectively but is, instead, a person with feelings, emotions, anxieties, values and preferences, all of which must be respected and incorporated in the medical encounter. That is, medicine began to redefine the doctor-patient relation as inter-subjective, as a relation of self to other in which the perspective of the patient (and not just that of the physician) is taken into account. One way in which medicine has been able to create and institutionalize a voice and a sense of agency for the patient was by adopting a market model of the medical encounter in which the patient was defined as a consumer (a 'customer') with needs and wants that the physician - a provider of health care services- would try to satisfy. First conceptualized in the UK about thirty years ago, this market model of medicine has consistently gained acceptance in Canada and the US, where the currency of the idea of the patient-as-consumer is revealed in the 'satisfaction surveys' that patients are routinely asked to fill out for the purpose of improving health care services. While the patient-customer is rightly celebrated as an individual who is empowered to partake in medical decision-making, this paper proposes to bring to view some of the uncanny relations to health, disease and care that the market model of the medical encounter unwittingly promotes.

Use of social networking sites to identify the social determinants of HIV among MSM. *Katya C May, Griffith University*

Background: After decades of steady decline, rates of HIV infection have increased in many developed countries since 1999. There are also well documented changes in the sexual behaviour of men who have sex with men (MSM) in Australia. HIV prevention interventions continue to be designed to address downstream determinants of HIV risk; issues such as condom use, knowledge of HIV, personal attitudes and individual behaviour. A gap in current research is the rapid identification of these upstream social determinants of risky HIV behaviour. This paper discusses new ways of engaging the public (to identify the causes of the causes) via some of the communication tools they already use. These tools, namely internet social networking sites, are efficient and cost-effective ways of accessing hidden populations such as MSM and some of the other most-at-risk populations. Methods: The methodologies used in this research were Time-Location Sampling (TLS) and Snowball Sampling by way of Internet Social Networking sites. By the time of submission of this abstract 506 MSM from South East Queensland, Australia (SEQ) had been surveyed via TLS. Potential participants were recruited in person at venues randomly selected from a universe of venue-day-time periods where MSM can be found in SEQ. Snowball sampling via internet social networking sites resulted in 623 MSM in Queensland completing the questionnaire. In both methodologies the participants completed the same questionnaire; the questions asked about risky sexual behaviors, felt and enacted stigma as well as social and family support. Results: A comparative analysis will be conducted on the data collected via both methods and is what will be presented in this paper. Of the TLS participants, 65% reported unprotected anal intercourse (UAI) in the past six months. In bivariate analyses, enacted stigma (n=174) was related to each form of risk UAI. Due to the distribution of the UAI variable, a negative binomial regression was fit to calculate incidence rate ratios (IRR). In the analysis, an increased rate of risk UAI was found for enacted stigma (IRR=1.6, 95%CI: 1.4, 2.1), and lack of social support (IRR=2.6, 95%CI: 1.8, 4.7). The data collected via the snowball sampling methodology is still being analyzed. Initial analysis shows that the relevant correlations between variables hold. Conclusions: Snowball sampling by way of Internet Social Networking sites is not a substitute for probability-based methods. Since in the initial results of this study the relevant correlations between variables hold, this may justify using Snowball sampling by way of Internet Social Networking sites to do a study that is representative of the entire population. This methodology also lends itself to broadening international research since as many as seventy percent of users of some social networking sites are located outside the USA. This methodology also increases the opportunities for faster, cheaper, and farther reaching research.

072. Post-Modernity and Military Technology: Metaphysics & Ethics in the Revolution in Military Affairs

3:00 to 4:30 pm

13: 1322

From the days of the long bow and the stirrup to the invention of barbed wire and the tank, technological innovations have profoundly affected the nature of warfare and statecraft. Nonetheless, the latest wave of technological innovations seems qualitatively different—post-modernity arriving at the military world. Homeric assumptions about the nature of war and valor are being upended. Basic conceptual distinctions that go back to Grotius—such as distinguishing between the states of war and peace, and between combatants and non-combatants—are being overturned. War is becoming virtual, fought by robots, or by men and women thousands of miles from the actual conflict, digital warriors in cyberspace. Through a critical engagement with STS literature, this panel explores the sociological and philosophical dimensions of what is known as RMA—the current Revolution in Military Affairs. This panel will reflect on these topics, and on the fact that such interesting and socially relevant topics are so under-represented within the STS literature. The U.S. Federal government devotes over half of its R&D budget to the Departments of Defense and Homeland Security. Yet only a handful of the 204 sessions at the 2009 4S annual meeting (in Washington, D.C.) focused on military and security technology.

Participants:

Drone Wars: The Imminent Empire of the Nintendo Jock. *Adam Robert Briggle, University of North Texas*

The United States intelligence communities and military are increasingly relying on drones or unmanned aerial vehicles (UAVs) to conduct surveillance and combat missions in Iraq and Afghanistan. Three factors seem to be driving this trend: a) reduced costs compared with traditional manned airplanes; b) reduced risks posed to the lives of American intelligence officers and soldiers; and c) increased targeting accuracy that holds out the promise of reducing the fog of war and collateral damage (though this goal is proving more difficult to realize). Taken together, these factors could comprise the promise of UAVs: they allow military and security leaders to accomplish their goals with less cost and less risk. Seen from this perspective, UAVs are more efficient instruments of warfare. In this paper, I challenge this instrumentalist justification for (military and security applications of) UAVs. Drawing from Langdon Winner's notion of "reverse adaptation," I argue that UAVs are not neutral means for set ends, but are adjusting the ends to suit their characteristics. This adjustment is occurring on at least two levels: a) on the geopolitical level, UAVs introduce "mission creep" from traditional armed engagement with combatants to more systemic interference in and control of culture and society; and b) on the individual level, UAVs radically alter the traditional experiences and virtues of the warrior from engaged bravery to removed calculation. Another way to parse these two kinds of adjustments is in terms of their effects on (a) those being monitored and attacked by UAVS and (b) those doing the monitoring and attacking. I use Michel Foucault's notion of "panopticism" to characterize the geopolitical adjustment. Due to their very "lightness"—cheap and easy to operate—UAVs allow for a more sustained and systematic exercise of power. Citizens of a country patrolled by UAVs are bound to internalize this sense of being monitored and will therefore be disciplined into desired behavioral patterns. UAVs, then, transform the goals of war from defeating enemy combatants to disciplining non-compliant cultures. They invite a panoptic form of imperialism. I use Albert Borgmann's notion of the "device paradigm" to characterize the individual adjustment. UAVs further perfect the promise of technology within the context of war to render killing, control, and surveillance readily available (instantaneous, ubiquitous, safe, and easy). Missions can now be accomplished remotely from the comfortable confines of an air-conditioned trailer in Las Vegas. Disburdened in this way, the warrior's traditional virtues atrophy and are replaced by engineering and systems-operation expertise. As it is conducted remotely, killing is sundered from its context and rendered as unreal as a video game. UAVs, then, transform the experience of war from existential engagement to the consumption of a commodity. Both adjustments suggest the same moral judgment: UAVs render warfare too light, too cheap, and too easy. As General Robert E. Lee noted, "It is good that we find war so horrible, or else we would become fond of it."

Robotics, Youtube, and Hegel's Master-Slave Dialectic. *Robert Frodeman, University of North Texas*

In 2003 the US Military had no robotic warriors in Iraq. A year later the number was 150. In 2005 there were 2400 robotic systems in Iraq. At the end of 2008 there were more than 12,000 robots operating with military personnel. These robots engage in reconnaissance, surveillance, monitoring, and combat. In the first nine months of the Obama administration more drone attacks were ordered in Iraq and Afghanistan than in both terms of the Bush Administration. The rapid expansion of robotics is fundamentally changing the experience of war for both spectators and participants. Indeed, it makes problematic the very distinction between the two, when "participants" are able to "fire" a weapon from an air-conditioned trailer 8000 miles from the site of the explosion. Just as bicycle helmets have been shown to increase the number of bicycle accidents, war at a distance is an easier choice for a nation to make than when the visceral nature warfare is immediately present. Robotics is also leading to the deskilling of the military. Where once it took several years and more than $10 million dollars to train a fighter pilot, it now takes but 120 hours of training to move from complete ignorance to being certified to "fly" UAVs in combat missions. The net result is the reversal Hegel described in the Phenomenology of Spirit: masters become the slaves of their slaves. War not only becomes virtual; it also increasingly becomes automated, with embedded algorithms making decisions. The ethics of war become distributed in new ways: if a robot malfunctions and kills an innocent, who is held responsible—the soldier playing what amounts to a video game? His commanding officer? The author of the computer code? The hardware manufacturer? Similarly, the very distinction between combatant and non-combatant becomes problematic, raising questions of the definition of terrorism and what constitutes a legitimate target.

The U.S. 'Human Terrain System': Social and Military Science Perspectives. *Steven Hrotic, University of North Texas*

A new form of psychological operations is being employed by the US Military: the 'Human Terrain System' (HTS) which deploys trained social scientist civilians (e.g., anthropologists) with military units in Iraq and Afghanistan in order to reduce cultural misunderstandings, improve relations with local leaders, and generally increase the effectiveness of the US Military. Despite claims for the success of the HTS program, a proliferation of controversies (from both military and academic personnel) has been noted, with reports of 'blacklisting' anthropologists from both sides - military blacklisting anthropologists who refuse to participate, and academic blacklisting of those who do. While some of the criticisms made of HTS are fairly clear (e.g., the program is quite expensive, and successes are difficult to quantify), others raise more vexing questions. For example, some have argued that HTS is incompatible with the ethical obligations of the anthropologists, e.g., the ethical requirement that anthropologists only act for the benefit of the cultures they study. Moreover, "psychological operations" such as [explain the term] typifies the 20th century. I will argue that the controversies surrounding the HTS program stems from a clash between facets of two knowledge societies (psychological operations in military science, anthropology in the social sciences) each with their own historical reasons and present-day challenges to resist HTS.

Cyber-terrorism: Implications for National Security. *Jonathan Parker, University of North Texas*; *George Lucas, Stockdale Center for Ethical Leadership*

To understand what is truly "revolutionary" about the current Revolution in Military Affairs we must see how long-entrenched categories are evaporating. Foremost among these is the category of "military" itself and its binary "civilian." Of course,

technology has for some time contributed to the blurring of these boundaries: the fire-bombings of World War II and contemporary guerilla warfare are clear instances of war leaving the distant front and roosting closer to home. Yet these incursions were still traceable to a traditional, state-sanctioned military force. German, British, and American military-industrial complexes provide the necessary assemblages to coordinate and perpetuate such attacks. With cyberwar this assemblage is not necessary and, thus, the threat can be decoupled from any mooring to a traditional military. There are three senses in which cyberwar is probably best labeled "cyber-terrorism." First, state involvement is not necessary (though there could be state-sponsored cyber-terrorism). This means that the motives for attack are multiplied beyond national security or ambition to include personal greed, conceit, ideology, or nihilism. Second, the "battlefield" is rendered ubiquitous as any electronic or digital system becomes a potential site of attack. This points up one of the ironies of technology - dependency on the functioning of complex artifacts and systems introduces new vulnerabilities in addition to new wealth and comfort. Third, a new asymmetry is introduced by which the weaker become the stronger - a skilled cyber-terrorist with a minimal budget could cripple the financial, energy, information, or manufacturing sectors of entire nations. There is another sense in which cyber-terrorism is new in kind. The kinds of terrorists currently grabbing headlines target individual artifacts (e.g., an airplane or a building), but cyber-terrorists target the networks that enable the functioning of individual artifacts. This has a double-edged effect: it is potentially far more destructive, but without instigating the psychological terror that tends to drive policy responses to traditional terrorist threats. Cyber-terrorism so understood admits of a utopian and a dystopian future. In the former, scenario, the wild-west character of cyberspace is brought under the rule of international law with shared standards of transparency and openness. James Fallows (2010), for example, argues that China will be motivated to join this new world order, because as it continues to modernize its vulnerabilities will be increased without greater laws in place to enforce cybersecurity. But this restricts cyber-terror to a frame focused on state interests and assumes that nations will have the ability to control cyberspace. The dystopian view broadens the frame of reference: states are not the only actors with interests involved and with capacities for shaping cyberspace. The result may be the escalation of lawlessness, crime, and cyber-attacks. If states are indeed impotent, then cyberspace may well collapse or balkanize into discreet networks. If states are not impotent, then their laws will restrict liberty in the name of security.

Discussant:

Daniel Sarewitz, Arizona State University

073. Implications for STS of Oral History

3:00 to 4:30 pm

13: 1331

Oral history includes the collection and analysis of in-depth interviews. The use of such interviews can be quite valuable for STS studies, but that is not well understood in STS. This is the central topic of our session. Using specific examples we discuss some ways oral history can contribute to STS research. Interviews with scientists may reveal some significant points not covered in documents. Collections of personal histories might be useful in showing what retired scientists think is worth transmitting and being documented. Such interviews might show important features of scientific communities and their practices. It is useful to collect stories from as many people as possible, not only laboratory and research group leaders. For example, many non-scientists in and near laboratories are influenced by the research there and have viewpoints about it. Through oral history interviews the perspective of secretaries and spouses about science and research can be compared with those of scientists and those living near the laboratory. We need to understand more about the many points of view about science and research in society. The session consists of four papers. First, Takaiwa presents an oral history project on the first ten years of KEK; then Hirata will discuss multiple perspectives on the construction of KEK accelerators. Takikawa will propose ways to analyze the interviews. Finally, Perry will discuss how oral history helps to understand the circulation of research technique. Discussants will compare these oral history studies with other kinds of STS approaches. Session organization Panelists 1. Yoshinobu Takaiwa, Tsukuba University of Technology. Japan. takaiwa@k.tsukuba-tech.ac.jp 2. Kohji Hirata, Sokendai, the Graduate University for Advanced Studies, Japan. hirata@soken.ac.jp 3. Hiroki Takikawa, Sokendai, the Graduate University for Advanced Studies, Japan. takikawa_hiroki@soken.ac.jp 4. Daniella Perry, UCLA, USA dgperry@gmail.com Discussant 1. Sharon Traweek, UCLA, USA traweek@history.ucla.edu 2. Naoko Kato, Sokendai, the Graduate University for Advanced Studies, Japan. kato_naoko@soken.ac.jp

Participants:

The Oral History Project "The first ten years of KEK": How did it start and proceed. *Yoshinobu Takaiwa, Tsukuba University of Technology*

The oral history project "The first ten years of KEK" which is now underway was planned to understand social and historical meanings of influences of the establishment of KEK, High Energy Physics Laboratory, as the very first inter-university research institute of Japan. The KEK is one of main high energy physics laboratory in the world now but before its establishment and the earliest days of it were not easy. Finally it was built in 1971, and successful establishment of it has been regarded as a triumph of the democracy; the KEK was proposed after intense discussion among nuclear and particle physicists within a framework of the organization of academic societies, The Science Council of Japan, which was regarded as a body to realize "democracy" in the community of scientists. After this, the influences of it have been seen in various aspects. In our project, selection of interviewees for oral history interviews were made according to the discussion of focusing on some of such aspects. The examples of them are the following: One is the changes in structure of the community of researchers and their working practices. And also cultural exchange between people based at domestic institutions, in particular, of younger generation and experienced researchers who had chances to work abroad and then returned to Japan to help establishing KEK. The other example of such aspect we are interested in is social and cultural impact on both local people of an agriculture based rural area and highly educated and academic people moved to this area as newcomers due to the introduction of KEK. In addition, the first stage planning of the project includes understanding and making strategies of necessary procedures to process oral history interview records as an important step, such as making and editing their transcriptions, archiving them to be refered by public, and analyzing the interviews with appropriate methods, all of which are apparently not simple nor trivial. The strategies for them we are now employing are also discussed.

An Accelerator, Ten Histories. *Kohji Hirata, Sokendai, the Graduate University for Advanced Studies*

Based on the oral history project "KEK, the first ten years", several different lives are introduced, each related to the accelerator constructed in KEK. It includes 1) An accelerator theorist happened to design the first accelerator of KEK, KEKPS, 2) His wife 3) An experimentalist doing environment movement after his retirement, 4) An experimentalist who has left physics, 5) An Chinese-American physicist who helped the construction of PS, 6) A theorist worked in KEK but had little to do accelerator project, 7) A wife of an accelerator physicist working in a local junior high school as a music teacher, 8) A theorist struggled to establish particle data group in Japan, 9) An experimentalist who later devoted himself to the improvement of the beam source, 10) A theorist who later became the director of KEK. These stories may be analyzed in several ways but above all they are all very interesting and lively.

On the Analytical Strategy for the Oral History Project "The first ten years of KEK":. *Hiroki Takikawa, Hayama Center for Advanced Studies, The Graduate University for Advanced Studies (Sokendai).*

Our project aims to understand social and historical significance of KEK, which is High Energy Physics Laboratory, as the very

first Inter-University Research Institute of Japan. We focus on the organizational structure, political and social relations of researchers in KEK, informal organization, and so on. We interviewed various people from a life history perspective to explicate diachronic aspects of social and cultural events around KEK. We have collected oral history data on KEK narrated by a wide variety of people involved in KEK. How should we analyze these data? Oral history makes it clear that even a single social event can be described in a plural and multiple ways depending on narrator's identity, social position and life history. But beyond recognizing the plurality of the description, we also try to explore "causes", or "generative mechanisms" of the differences of narratives. To do so, we must introduce life history perspective into analysis of data in a very systematic way. Only if we connect social and cultural events with people's life histories, we can understand how they interpreted the event, what idea they become to have and why they acted in such a way. To analyze data in a systematic way, we adopt the coding system for clarifying the structure and networks of narrative and relating it to social and cultural events. We encoded social and cultural events narrated by actors and mapped them into a coherent picture. To do so, we are able to discover the structure and networks of events narrated by actors and deepen understandings of the historical configurations of events. More concretely, we have gained some understanding of the manner of people's identity formations by various social and cultural factors such as social classes, family background, religions where they grew up, periodic effects and other things. Furthermore we were able to clarify to some extent how their choices in their life history's turning points are affected by social and cultural factors and in turn these factors are formed by their conscious and unconscious decisions. About the history of "The first ten years of KEK", we tried to understand the history of KEK in that period by connecting it with narrator's life history. For "The first ten years of KEK" are differently perceived depending on the narrator's identity which was formed through her history. From this perspective we discovered several interesting aspects of the history of KEK , for example,"KEK as an educational strategy","inside/outside KEK as the critical distinction used by researchers", "Communitarianism in Japaenese Physics", and so on. These aspects are perceived by actor's "subjective theory."So, as well as considering to what extent these "theory" are creditable, we have to explore the reason why each person come to hold his theory. In our presentation we will discuss the above points with concrete examples.

Discussants:

Sharon Traweek, UCLA Women's Studies & History Departments

Naoko Kato-Nitta, Sokendai, the Graduate University for Advanced Studies, Japan

074. Tradition in Scientific View

3:00 to 4:30 pm

5: 511

Participants:

Botanical Medicine Safety Debates: The Kava Controversy, 'Pharmaceuticalization', and Pharmacovigilance. *Jonathan Baker, University of Hawaii at Manoa*

This paper examines the social, biological, and contextual aspects shaping benefit/risk assessments of ingested substances (foods, medicines, and drugs). Drawing on fieldwork conducted in Hawaii from 2003-2007, I present a case study of the processes of risk assessment by following the debate about the safety of kava (Piper methysticum G. Forst., Piperaceae). This plant, which is native to Oceania, where it has a long history of traditional use as a socially and ceremonially important beverage, became popular as an anti-anxiety treatment in Western countries in the late 1990s. In 2002, kava-containing medicines (pills and tinctures) were banned in many countries because cases of serious liver injury in Western kava medicine consumers were found. Proponents of kava continue to contest these bans in the face of regulatory systems dominated by the biomedical perspective that medicines derived from botanical sources are unsafe and untested. Meanwhile, kava drinking continues unabated throughout much of the Pacific, where no evidence of toxicity has been seen, and where people remain puzzled as to why Westerners claim kava is dangerous. This case study is significant because it contributes to the STS literature on pharmacovigilance, risk, and regulation through an examination of a botanical medicine. The significance lies in the legal and regulatory status of plant medicines, which influences the outcome of controversies in important ways. Most countries allow botanical medicines to be approved based on a history of 'traditional use', without the need to conduct new clinical trials. Also, botanicals for the most part cannot be patented. The result is a market comprised of competing, relatively small-scale producers, for whom there is little incentive to invest in challenging bans. Despite pressure from biomedicine to increase standardization and refinement of botanical medicines - in essence to further 'pharmaceuticalize' them - the economic and regulatory factors combine to resist this push. As a result, plant medicines easily fall prey to evidence indicating adverse effects, whereas the same level of evidence has typically not been sufficient to lead to regulatory action against pharmaceuticals. On the one hand botanicals are attacked for not being pharmaceuticalized enough, while on the other hand they are seen as valuable precisely because they are not pharmaceuticals. Lost in the legal and regulatory shuffle of these debates are the 'traditional' consumers of the plants in question - the owners of the knowledge about these plants that led to medicinal use in Western contexts. The simultaneous importance of 'tradition' and the marginalization of 'traditional' consumers will be discussed with respect to both the kava controversy and the larger context of bioprospecting in general.

How Does Traditional Medicine Become Scientific?: The Evolution of fMRI Research on Acupuncture. *JONGYOUNG KIM, Department of Sociology, Kyung Hee University*

This study explores the recent scientific translations of acupuncture through functional MRI. By doing so, I aim to understand how traditional medicine can be interpreted as scientific in terms of recent developments in science studies. First, this study examines the initial fRMI experiment with acpuncture and then traces the worldwide diffusion of fMRI studies on acupuncture. It points out that global competition spurs expansion of the field as well as new findings. Second, it tries to determine why fMRI research on acupuncture has become so popular, and how scientists and traditional doctors have joined the research. Third, it examines how controversies occur as others tested the original experiments and obtained different results. Theoretically, I interpret the experiment as an open-ended tuning process among heterogeneous elements. Ultimately, I argue that the scientific translation of acupuncture via fMRI is achieved through partial connections among the acupuncture phenomenon, material devices, and neurological theories.

Mind and Machine in Neuroimaging Studies of Buddhist Meditation. *Catelijne Coopmans, National University of Singapore*

Previous studies in the sociology and anthropology of scientific knowledge have proposed to understand brain imaging as a constructive practice; one that in representing "consciousness" (Cohn, 2004; Roepstorff 2004), "the mind" (Beaulieu 2002), and "the person" (Dumit 2004) also composes them, brings them into being, renders them real and thinkable in certain ways. Following in the footsteps of such analyses, this paper examines the co-construction of mind and machine in neuroimaging studies of Buddhist meditation. Neuroimaging studies of Buddhist meditation make use of experienced meditators - typically Tibetan monks with between 10,000 and 50,000 hours of meditation practice - to determine, experimentally, both short-term reactions in the brain during meditation and lasting changes

in brain structure and function due to the practice of meditation over time. Data derived from fMRI, PET and SPECT, in conjunction with electroencephalographic (EEG) information, have given researchers reason to believe that experienced meditators can generate brain states (and exhibit lasting traits) associated with positive emotions and well-being, in ways that differ significantly from those found in control subjects. In and through these neuroscientific investigations, the mind of the experienced meditator gets defined as a higher level of consciousness in a way that positively contrasts it with the "normal" mind. At the same time, because experienced meditators are considered to have the ability to control their minds to a greater extent than other people, their data help define and exploit the technical capabilities of the imaging machine. The paper contends that, in order to understand this process of mutual construction, it is not enough to see Buddhist meditation as merely another subject of the ever-expanding neurosciences. Tibetan monks are not just "subjects"; they actively participate in the conceptualization and design of the experimental protocols. The Dalai Lama himself, well known for his lifelong interest in science and hailed by a prominent scientist as having "what seems an almost preternatural feel for data and the methods of science" (Goleman 2003: p.10), is a committed participant in roundtables and conferences on the study of mind. The dialogues between Buddhism and Science that have taken place in recent years are widely reported, not just in scientific papers and the mass media but also an in-between genre of science-and-spirituality writing (e.g. the books associated with the Mind and Life Institute in Boulder, Colorado, USA) that aims to do justice to both traditions and reach a broad audience. The paper draws on these writings by practitioners and commentators to articulate how neuroimaging studies of meditation come to serve as a meeting ground for the two epistemic cultures of modern science and Buddhism, and with what ramifications for the mutual construction of machine and mind.

The Discovery of Artemisin—a Case Analysis about one Scientific Discovery' Priority Dispute. *ZHOU Cheng, Peking University*; *Wang Bin, Peking University*; *ZHANG Wen-Hu, College of Humanities and Social Sciences,Chinese Academy of Science*

Since 1960s, the United States and other developed countries invested a lot to develop new antimalarial drugs for Vietnam War, but had nothing to break after spending several decades. At that time, China firstly developed new antimalarial drugs with new structures——artemisinin in only 10 years, achieved a great "breakthrough". So who is the real discoverer of artemisinin? Even the participators of "523 Task" haven't reached a consensus on it. Thereamong, "Tu You You Group" of Institute of Chinese Materia Medica, China Academy of Traditional Chinese Medicine continuously proclaimed itself as the first invention unit of artemisinin. But the remaining members of the "523 Group" had a very different view about this. This paper reexamined the course of events of the artemisinin research and the respective achievements achieved by some key research groups(Institute of Chinese Materia Medica,China Academy of Traditional Chinese Medicine; Shandong Province Institute of Chinese Materia Medica; Shandong Province Institute of Parasitic Diseases, Yunnan Province Institute of Materia Medica, Guangzhou College of Traditional Chinese Medicine) of the "523 Group" in 20th century 70s. The conclusion is: "Tu You You Group" firstly discovered and identified the antimalarial effective parts of Artemisia annua L.. Soon after, they foremost extracted the artemisinin crystal, but due to various reasons, the clinical efficacy of their artemisinin crystal was poor. Well, Shandong Province Institute of Chinese Materia Medica and Yunnan Province Institute of Materia Medica respectively extracted the antimalarial effective monomer—Arteannuin and quickly obtained conclusive evidence of clinical efficacy. Thereamong, the clinical trials of the arteannuin extracted by Yunnan Province Institute of Materia Medica were mainly completed by Li Guo Qiao antimalarial collaborative group of the Guangzhou College of Traditional Chinese Medicine. So from this view that the priority encourages originality and original innovation, it is the "Tu You You Group" that firstly extracted and identified the antimalarial effective parts of Artemisia annua L., they also firstly discovered the correct extraction method of artemisinin; But from the view of the effect of the clinical trials, the clinical test effect of the latter two institutes were better than the former's. But the work of the latter two institutes actually was the imitate and improvement of the former institute's research method and model. Even though the latter two institutes verified their clinical effect before the former, their work wasn't a true original innovation. From this view, "Tu You You Group" is undoubtedly the first discovery unit of artemisinin. The contribution to the document of STS : the author also found that the focus of the disputes about the priority of the scientific discoveries were mostly concentrated on the ones which happened among the foreign scientists, and this kind of researches about Chinese scientists is scarce. Then why this kind of phenomenon happened? What's the origin of the priority dispute on the discovery of artemisinin? And what are the differences between this case and the foreign ones. What's the theoretical and realistic meaning of this case? And this paper will analyze and discuss about these issuses.

075. Open Source Software and its Culture in Taiwan

3:00 to 4:30 pm
5: 512

The purpose of this session is to examine the different aspects of open source software and its culture in Taiwan. The free software movement was originated by Richard Stallman in 1983 in the US context to advocate among computer programmers the freedom to run, study, redistribute and improve software. However, this culture is not only about using free software (as free beer), but it is also about constructing a different perspective of knowledge building and information sharing. In the year of 1991, open source software was introduced to the university campus in Taiwan. Since then, open source software has been one of the means of information processing and communication for the people in Taiwan. Even though it is meaningful in its original context, open source software has to adapt to the Taiwanese context in order to generate its local meaning. It becomes an important issue if open source software can meet the needs of the local people and can solve the important problems defined by the local people. In this session, Eric Sun will start by presenting OSSACC, a project commissioned by the Software Liberty Association in Taiwan, about the promotion of open source software and materials in schools. He will addresses the promotion strategies employed in various stages and the modifications made in order to have open source software better perceived by teachers and students. The second presentation made by Justina Hsu will use Actor-network Theory as the major theoretical framework to discuss the translation of open source software and its culture at school. Adopting interview as the research methods, her study is based upon a case study of three elementary school teachers prompting open source software at school. The gap between the context of students and teachers and the context of computer programmers makes the translation difficult; various strategies are employed by the proponents to focus teachers' attention on the connection between open source software and their work. In addition to the discussion of localization of open source software, this session looks at the translation of free culture in a broader sense. The third presentation made by Chao-Kuei Hung is about Taiwanese universities' and their professors' indifference about free culture. Instances such as embedding flash files in the portal and cyber attack on Google China prevents user from having a convenient and safe Internet environment. But they are repeatedly ignored as most universities and their faculties are obsessed by visions provided by commercial software companies. The final presentation made by Ching-chen Mao is about the need for free information, which is free for people to use, distribute, copy, improve and redistribute. In the future, free information will become more and more important. On the one hand, in order to make open source software a substantial concept, it becomes essential to have free information running on open source software programs. On the other hand, free software protects the circulation of free information from being hindered by proprietary information technology and ensures that users can freely use the information.

Participants:

The Promotion of Open Source Software and Materials in

Taiwanese Schools: The OSSACC perspective. *Eric Sun, OSSACC*

OSSACC, the acronym for Open Source Software Application Consulting Centre, is a project organized by the Ministry of Education in Taiwan. Since its initiation in the year of 2003, this project has been commission by the Software Liberty Association in Taiwan (SLAT). The major goal of OSSACC is to promote open source software and free licensed teaching/learning materials to all schools in Taiwan. Since 2003, OSSACC has been utilizing different promotion strategies to advocate the use of open source software and materials. Due to the acceptance of open sources software, it focuses on infrastructure, campus application software programs, and teaching application programs respectively. In the current stage, it initiates three important projects. The first one is called "EzGo" project, which is to collect and categorize open source software for the educational purpose. The second one is called "Westart" project, which includes two sub projects, "Wekey-wiki" and "Tryneeds-Chinese". The third one is a project on open materials. EzGo is a Linux distro composed of educational software and free licensed teaching/learning materials. The EzGO is very easy to use for educators. Educators can load the EzGo disk into their computers and will immediately be ready to use the open source software programs and materials created by people all over the world. Westart project plays the role of providing users who are interested in open source software and intend to improve open source software and open source materials. Wekey-wiki, one of the sub projects, is a wiki-based platform for users to suggest and edit brief introductions of open source software. Users' contributions make open source software friendlier and easier to use for new users. Also, the other sub project, Tryneeds-Chinese, an on-line translation interface, lowers the technical barrier and let more people to help with software translations. In order to integrate open source and open standard materials into school courses, the third project is launched to promote PhET and Chemical Structure. These two software programs provide good interaction and simulation and can improve teachers' teaching and students' learning. In these years, OSSACC has been modifying its promotion strategies. Open source software has been considered to be very difficult for computer laymen. In order to make it accepted by educators, it starts to lower the technical requirements for users. In addition, it tries to put ourselves in the educators' shoes and tries to find the meanings of open source software and materials in the teaching/learning contexts. In the presentation, I will also talk about the difficulties that OSSACC encounters when promoting software and why these projects are better received by the educators in Taiwan.

Translation of Open Source Software and its Culture in the Elementary School in Taiwan. *Hui-mei Justina Hsu, Fo Guang University*

This study is based upon a case study of three elementary school teachers promoting open source software at campus. The major purposes of this study are to understand how the proponents for open source software promote its use, why they promote the use of open source software and the possible reasons which influence the effects of the promotion. Interview is adopted as the major research method for this study. As the diffusion of open source software can be viewed as a process of translation, this study adopts Actor-network Theory (ANT) as the major theoretical framework. In order to gain supports from the other agents in the heterogeneous network, the target technical artifact, open source software in this case, needs to provide effective solutions to the problems that are deemed to be interesting and important to the other agents in the network. The major contribution of this paper is to present how open source software is dynamically constructed in the Taiwanese schools. Four major findings are generated from the case study. First, sharing, which is an important value in free culture, is difficult to be translated into school culture. Open source software thrives among computer programmers, but school teachers and students can hardly perceive its importance. Due to the differences in terms of the level of participation, the interest of participation and the role of participation, school teachers and students can only perceive of it as being free (as free beer) and being legal, the two major reasons for using open source software at school. Second, the proponents use open source software for student instruction if they teach computer classes at their schools. Due to the fact that computer is not tested in the entrance exam, the proponents have the freedom to decide their curriculum. As far as the promotion among teachers is concerned, they promote the use of open source software for technology integration. Even though they held teachers' workshops, the effects are limited. Most teachers still don't see how open source software can solve their teaching problems. They attend the workshops but are not eager for the implementation of open source software in their curriculum. Third, the recognition of school administration is very important. In the Taiwanese elementary school culture, principals have the major administrative power at school. Without principals' support, the promotion of open source software is very difficult to be successful. Fourth, the promotion strategies are important factors influencing the school adoption level of open source software. In the three schools observed, the levels of adoption are different. The most successful proponent teacher only introduces open source software programs that are relevant to teaching. In this way, he proves to the other teachers that open source software can solve their teaching problems. Another teacher gives other teachers incentives such as providing a laptop for course preparation if they never install Microsoft Office on that laptop. Such strategies intend to focus teachers' attention on the connection between open source software and their work.

Universities' Unspoken Insistence on the Attack of Their Own Interests Using ICT in Taiwan. *Chao-Kuei Hung, Chaoyang University of Technology*

Information and Communication Technologies are supposed to bring convenience and productivity to our lives. Universities are supposed to be an important source of knowledge as to how ICT can be applied towards such ends and how its detrimental effects can be avoided. Yet a few incidents of misuses of ICT resulting in the attack of a University on its own interest reveals that its ICT policy (if there is one) and therefore the education it promises to deliver to its ICT students may not live up to the expectation of the society. Furthermore, its unspoken insistence on this perplexing behavior is demonstrated by the lack of active discussions among the ICT-related professors and the lack of their suggestions to the University even after such behaviors are widely discussed in the public. And such strange phenomenon is typical among most universities in Taiwan. Adobe's Flash technology is heavily used in Taiwan far beyond its raison d'être. It is not only used for viewing embedded videos or interactive games but also used in the front page of many web sites, where typically there is a flash whose sole purpose is to display pictures and to embed two hyperlinks to the real home pages (in different languages). When ill-designed (which it usually is), it serves to block access to the real home pages by rendering the hyperlinks inaccessible from browsers withoutthe Flash plugin. A serious security hole in Flash that enables malicious websites to remotely monitor its Flash-using visitor was exposed and later made widely known. Yet many university department home pages still use it today, and there is not a single University in Taiwan that publishes a policy to discourage the unnecessary uses of the Flash technology. Recent cyber attack on Google China is based on the abuse of a security flaw of the Microsoft Internet Explorer. The University at which the author works did not issue any security alert either after it is known, after Microsoft issued a security patch, or even after the attack code was published and even found to be widely deployed in various websites. The reason? The internal information system that all faculty, staff, and students are obliged to use frequently has a heavy dependency on an old version of IE. It was not possible for the University to advise its faculty, staff, and students to switch to alternative browsers (such as Firefox) as the German government and the French government did. One such incidence in one single

university may not mean a lot. Yet such incidences repeatedly occur, and the professors in the IT departments across the entire country seem to remain unimpressed. Such strange phenomenon raises a serious question: do our society trust that our IT education can equip our future generations with any minimal sense of IT security issues if the IT professors consistently fail to advise their universities about such widely known serious security breaches?

Free Software Based Free Information. *Ching-Chen Mao, Fu Jen Catholic University*

To disseminate knowledge, people record it as text, sound, images, videos, etc., and package it as books, CDs and other merchandise. In the analog era, libraries used to lend a limited number of books to their readers for a limited period of time due to the cost of reproduction. Information technology makes duplication cost of digital information approach zero at the age of Internet. Libraries nowadays could lend unlimited works to their readers. However, the same technology is also used in the name of copyright law to confine the operation of libraries by non-free software. This paper discusses the development of free information around the world, and the important of free software for free information. 'Free information' is any information that people are free to use, distribute, copy, improve and redistribute -- without any legal, technological or social restrictions. 'Free software' is a matter of the users' freedom to run, copy, distribute, study, change and improve the software. There are 83 licenses approved by Free Software Foundation as free software licenses. The user prerogatives created by exceptions and limitations to copyright, fair use and fair dealing, allow user to use those proprietary information as free information. Works can also become free information if their rights holders voluntarily share them. Free Software protects the circulation of free information from being hindered by proprietary information technology. It ensures that users can freely use free information.

Chair:

Ching-Chen Mao, Fu Jen Catholic University

Discussant:

Chao-Kuei Hung, Chaoyang University of Technology

076. Energy Policies

3:00 to 4:30 pm

5: 513

Participants:

Enacting the Energy System - The Parliamentary Debate in Sweden 1980-2010. *Ann-Sofie Kall, The department of thematic studies-Tecnology and social change*

How is energy politics enacted, and how does the relationship between politics and energy work in practice? Energy is often treated as something neutral and the choice of an energy system as something rational. The aim of this study is to investigate how energy is done in practice and implicated into politics. Energy refers to a wide variety of sociopolitical issues such as environmental solutions as well as technical and economic optimality. The discussion around energy systems also refers to ethical questions on what responsibilities we have towards future generations. Drawing on concepts such as translation, boundary object and enactment, this study discusses how the Swedish Parliament has shaped the national energy system from 1980 to 2010. In 1980, the Swedish government decided to phase out nuclear power and replace it with renewable energy sources by 2010. The decision was a result of a referendum, which took place in March 1980, when the Swedish people had their say on nuclear power. The adaptation of the Swedish energy system constitutes an intriguing empirical example, not only because of the early decision to phase out nuclear power, but also because Sweden is often seen as a forerunner in environmental and ecological policy. Studying the Swedish Parliamentary debate on the adaptation of the energy system increases our understanding of national political goals, the translation of the Swedish energy system in a wider international perspective, and the approach of energy sources as an example of boundary object. The empirical material builds on policy documents and parliamentary records which are analyzed with textual analysis. The study illustrates how diverse political actors translate distinct values and interests into different energy sources within different contexts and during different time periods, concerning for example what is renewable and what is not. The argumentation has not only re-enacted the decision made in the parliament, but also the problem. During certain periods the adaptation of the energy system has solely concerned the phasing out of nuclear power, regardless what it would be replaced by, while during other periods the debate has concentrated on creating visions for a future lasting energy in terms of environmental and ecological sustainability. The Parliamentary debate has triggered a series of conflicts as well as intense emotions since the issue of the energy system adaptation did not only refer to finding the most effective energy solution but rather the discussion touched upon visions regarding how society should be formed.

Criteria of National Project on Domestically Developed Power Reactors and Nuclear Cycle Technology in Japan and Proposal of a New Evaluation Model. *Kiyoshi Sakurai, None*

The Japanese Government established Power Reactor and Nuclear Fuel Development Corporation(PNC) to develop domestic power reactors and nuclear fuel cycle technology as a National Project, on Oct. 2, 1967 on the basis of the proposal from Atomic Energy Commission(AEC). National Project spans four kinds of engineering development of (1) uranium enrichment, (2) reprocessing, (3) advanced thermal reactor(ATR) and (4) fast breeder reactor(FBR). Evaluation results of National Project by the Government Evaluation Committee (GEC) are summarized in PNC engineering reports. The acceptability criteria of National Project that are written in PNC engineering report do not necessarily seem to be based on technology that contributes to a commercial technology with the economic efficiency. (1)Japan Nuclear Fuel Limited(JNFL) introduced the prototype technology of centrifugal separator for the uranium enrichment that was developed by PNC. The production ability of JNFL commercial uranium enrichment plant is 1050 tSWU/y. The ability is 6300 tSWU/y by URENCO plant and 10800 tSWU/y by EURODIF plant. The enriched uranium price by JNFL reaches about three times as much as those by URENCO and EURODIF. Japan does not have international competitive power. (2)JNFL introduced a commercial reprocessing technology with ability 800 t/y from France, due to the uncertainty accompanied by the scale-up of the reprocessing technology by PNC. (3)AEC and Federation of Electric Power Companies of Japan(FEPC) canceled the construction of an ATR demonstration reactor with 600MWe based on an ATR prototype reactor developed by PNC, because the power generation cost reached three times as much as a light water reactor. (4)The technology of the prototype FBR is under development, because of long-term trouble by accident. 43-year results of National Project do not contribute to the commercial technology with economic efficiency in the present. The cause originates from the lack of leadership of AEC. AEC has a philosophy for engineering development that contributes to the future commercial technology with economic efficiency. However, it was not able to demonstrate strong leadership. As a result, PNC does not have a philosophy for engineering development as AEC does. The author proposes a new evaluation model for National Project that has an acceptability criterion used for the intermediate stage between prototype technology and demonstrated technology.

Political ecologies of renewable energy metrics: Contestation and commensuration in the life cycle analysis of biofuels and solar PV. *Dustin Mulvaney, University of California, Berkeley*

The deployment of renewable energy technologies is poised for growth with government support for climate change policy and green jobs investments. Yet, a number of questions have been

raised about sustainability and social justice in these emerging technological spaces, particularly as these developments increasingly rely of novel processes and materials. To investigate the impacts of these new technologies, tools such as life cycle analyses (LCA) and risk assessments have been deployed to better account for their full costs. But these environmental accounting techniques bring their own political and ontological orientations. This paper looks at the emergence of these LCA techniques in two renewable energy sectors: the solar photovoltaic (PV) and biofuels industries. It explores how metrics gain prominence, the politics of what is included and excluded, and how these metrics are used to make strategic decisions. The paper describes the extent to which various metrics are commensurated with information about distributional consequences such as community and occupational exposure to toxic materials for solar PV, or externality and livelihood impacts for biofuels. In particular, the paper looks at the role of risks from emerging technologies in LCA frameworks using cases of nanotechnology in solar PV and genetic engineering in biofuels. Data collected since 2008 are from a variety of sources included semi-structured interviews, participant observation, stakeholder dialogues, various e-media sources, in addition to data from peer-reviewed literature on LCA methodologies and risk assessment.

Risky entanglements?: the role of STS and the responsible innovation of second-generation biofuels. *Alison Mohr, University of Nottingham*; *Sujatha Leith Raman, University of Nottingham*

Under the guise of 'responsible innovation', there are increasing efforts to embed or integrate social science research within innovation systems at an early stage. From an STS perspective, these 'risky entanglements' of social scientific research within innovation systems pose two interrelated dilemmas. First, does embedding social science either help to reshape or transform science and innovation with respect to broader societal considerations (Fisher and Mahajan, 2006), or instead lead to a strategic - some might argue, rhetorical - re-alignment of language and terminology? Following on from this, what are the implications for STS and embedded social scientists? In this paper, we consider the implications for our role as social scientists in a 5-year programme of work funded under the UK's flagship BBSRC Sustainable Bioenergy Centre (BSBEC) that was launched in 2009. Among its six projects, one led by the University of Nottingham involves a focus on the production of ethanol from agricultural wastes such as straw. This second-generation approach to generating energy from agricultural wastes and woody biomass aims to maintain energy security and mitigate climate change and avoid potential conflicts over the use of arable land for energy or endangering food security that beset first-generation biofuels. This project is a beneficiary of the recent trend in UK research council funding to embed social science in scientific research so that wider social and ethical implications are considered in 'real-time', thereby fostering 'upstream' public engagement. Such interdisciplinary teams present new challenges to embedded social scientists in terms of their capacity to 'open up' rather than 'close down' (Stirling 2008) the process of engagement. Embedding provides new sites of mediation (Elam et al. 2007) where social scientists can help to create opportunities for reflection on broader expectations, interests and values. Yet, there is little analysis of how science and innovation are changing in response to embedded approaches; and the implications this may have for STS involvement. What does 'responsible innovation' actually mean for science and its practitioners? Is it a mere recognition of broader values and assumptions rather than an actual change in practices? More specifically, is the development of second-generation biofuels a genuine response to the wider concerns surrounding the first-generation, balanced against how much was already being done as a matter of (epistemological) course? Are we witnessing new practices (a strategic change in scientific research) or a shift in terminology (a rebranding of technologies to make them more publicly palatable)? Moreover, can STS retain a critical perspective when entangled within complex innovation systems?

077. Micro-Histories and Nano-Futures

3:00 to 4:30 pm
5: 514

The current practice of nanoscale science and technology (nanotechnology) is widely regarded - among practitioners and commentators alike - as something new. The conventional story begins with the establishment of the U.S. National Nanotechnology Initiative in 2001, with obligatory but passing references to iconic moments of the past, including Richard Feynman's Caltech speech ("There is Plenty of Room at the Bottom") in 1959; coinage of the term "Nano-Technology" by Norio Taniguchi in 1973; development of the Scanning Tunneling Microscope (STM) at IBM in 1981; and the publication of the book _Engines of Creation_ by K. Eric Drexler in 1986. Taken together, the conventional history of nanotechnology provides a teleological perspective leading up to the new vista of the 21st century. Within this framework, Feynman, Taniguchi, and Drexler emerge as "visionaries," who somehow managed to look through the thicket of time and peek into what the future has had in store. In this session, we eschew this standard history. Our goal is to identify multiple, competing strands of technical, organizational, and imaginative practices that has led to contemporary nanotechnology. While the overall configuration of nanotechnology might be novel, its various components were selectively borrowed, adapted, and recast from an abundance of available resources since the early 20th century. The impulse toward miniaturized electronic components is one of such strands that we take seriously. For example, Mills takes us back to the early 20th century, when the hearing aid industry blazed a path for miniaturization of electronic components, long before the advent of integrated circuits in the 1960s. By examining the "long history of miniaturization," Mills shows the various cultural imperatives that undergirds the phenomenon. In a similar vein, Mody begins with the microelectronics community in the 1970s, as it attempted to respond to the intense Japanese competition, and how it transformed its identity from "micro" to "nano" in the 1980s and 90s. The continuity and discontinuity between the Cold War imperatives of the 1950s and 60s and realities of economic competition of the post-1970s era are the focus of Choi's paper on materials science laboratories and their transformation into nanotechnology laboratories. Choi shows that much of the organizational practices - such as emphasis on interdisciplinary research - that we identify with contemporary nanotechnology owed much to the experiences during the height of the Cold War. Gray follows up on this theme of interdisciplinarity for a later period. Gray traces the vision of interdisciplinary research at Rice University in the 1990s and 2000s, identifying the complex dynamic that shaped nanotechnology practice. Finally, McCray will close the session with a discussion on California's high-tech futurist communities that supported early articulations of nanotechnology. These interconnected pro-technology movements stimulated privately funded research institutes and investment from high-tech entrepreneurs, as well as shaped government policy during the Clinton and Bush administrations. Taken together, these five papers will substantially broaden our conception of how nanotechnology came to be in the 21st century.

Participants:

Hearing Aids and the Long History of Miniaturization. *Mara Mills, Department of History and Sociology of Science, University of Pennsylvania; Department of English, University of California, Santa Barbara*

In this paper, I will trace the language and technical ideals of miniaturization to the first decade of the 20th century, prior to the development of electronics. I take the hearing aid as the key object through which to understand miniaturization. The diminution of hearing aid components and their connections facilitated the emergence of micro-electronics in the U.S. context. Subminiature vacuum tubes in fact originated in the hearing aid industry; the button battery, the transistor, the printed circuit, and the integrated circuit subsequently made their first commercial appearances there. I will draw on oral history, memoirs and a combination of school and corporate archives to demonstrate that deaf and hard of hearing people played significant roles as early adopters, inventors, retailers and manufacturers of miniaturized hearing aid components. This long view of miniaturization clarifies the cultural imperatives underlying the phenomenon: for

instance, the longstanding value of mobility and the ideal of perfect communication. Moreover, the history of hearing aids challenges the notion that miniaturization is somehow autonomous, linear, or outside the realm of society and politics.

From Microscience to Nanotechnology, 1970-2000. *Cyrus Mody, Department of History, Rice University*

In 1974, Norio Taniguchi coined the term "nano-technology" at a conference of precision engineers in Japan. With it, he gestured to the potential for new "microfabrication" techniques - electron-beam lithography, ion implantation, optical lithography, etc. - to carve features measurable in nanometers (billionths of a meter) rather than microns (millionths of a meter). In the mythology of nanotechnology (at least in Europe and the Americas), Taniguchi is represented as an irrelevant cul-de-sac in the field's development. Futurists such as Eric Drexler and civil servants at the National Nanotechnology Initiative are loathe to admit Taniguchi coined the term, and deny that he influenced later developments. Historians can only now show that this is an oversimplification; whatever Taniguchi's direct influence, he was one of many scientists and engineers in the '70s declaring a new age of miniaturization. The institutions and research groups created from those declarations later seeded many national nanotechnology initiatives. This paper traces American miniaturization declarations in the '70s. Buzzwords such as "sub-micron" science, "microscience," and "microstructure science" were featured prominently in influential venues such as Physics Today and National Research Council reports. Though no American actor (as far as I know) publicly adopted Taniguchi's term in the '70s, the American microfabrication community keenly observed trends in Japan. American declarations of miniaturization were saturated in the language of economic competition with Japan. Fears that the US would lose its perceived lead in miniaturization were exploited to persuade state and federal agencies to create new academic institutions for microfabrication research, to establish quasi-public facilities to provide microfabrication services to both universities and industry, and to produce new laws (and legal interpretations) that would make it easier for firms to collude with each other and cooperate with academia. Thus, miniaturization talk in the '70s participated in a critical transition from the Cold War to contemporary science policy. The Soviet Union was still a credible threat and the Cold War ethos of competition was still in full swing; yet the language of military competition was being retooled for other purposes. As an NRC report on "Microstructure Science, Engineering, and Technology" put it in 1979, "leadership in semiconductor electronics is essential to our national security." This paper illuminates the Vietnam-era context that encouraged American scientists and engineers to conflate national security and economic competition. I then describe the new institutions - conference series, journal, and microfabrication facilities - that emerged from that conflation. I briefly follow those institutions into the '80s and '90s, when they adopted the "nano" prefix and later became part of coordinated nanotechnology efforts. Finally, I end with some implications for today's research on societal dimensions of nanotechnology: whatever our hopes for using "future scenarios" and "real-time technology assessment" to give nanotechnology a humanistic perspective, today's nano is itself a product of a humanistic turn taken in the early '70s. We are living the "future scenarios" of that time.

The Spatiality of Materials Research, 1960-1975. *Hyungsub Choi, Chemical Heritage Foundation*

The "Inter-Disciplinary Laboratories (IDL)" program—which began in 1960 with funds provided to top universities through the Advanced Research Projects Agency (ARPA) constituted a watershed moment in the history of materials research in the US. By 1962, twelve IDLs were established around the country, which included most major research universities. While the ARPA funding for IDLs provided a stable source of income to undertake some of the critical materials problems facing the nation, it meant much more than simply an influx of cash. In most cases, universities selected for the IDL program constructed new buildings to suit the needs of the project: i.e., office and laboratory space for faculty members and graduate students, as well as large equipment in the shared facilities area. By the mid-1960s, many buildings appeared on university campuses to house an interdisciplinary team of researchers working on materials science. At the University of Pennsylvania, for example, the Laboratory for Research on the Structure of Matter (LRSM) Building opened its doors in 1965 at the northeast corner of 33rd and Walnut Streets. Similarly, at Cornell University, the Physical Sciences Building (later called the Clark Hall of Science) was complete in 1964, connecting Rockefeller Hall (physics) and Baker Lab (chemistry). There is no doubt that these new buildings have had a concrete impact on the practice of scientific research during the 1960s and beyond. This presentation will focus on the spatiality of materials science research in the 1960s by examining the cases of Penn and Cornell, two of the first three IDLs funded by ARPA in 1960. The new space allowed for new work routines and fostered interactions among different disciplines in ways that were not possible in the past. On the other hand, there were intense rivalries and hardball negotiations among people who were affected by the transition. At stake were difficult problems of maintaining disciplinary identity while encouraging interdisciplinary interactions; preserving the traditional role of the university; and weaving one's way through campus politics. Using primary documents from Penn and Cornell archives and oral history interview with faculty members, this presentation will examine how the spatial arrangement of government-funded interdisciplinary laboratories emerged and the negotiations that led to that arrangement.

Nanoscience and Interdisciplinarity in Context. *Summer Gray, University of California Santa Barbara*

One of the major goals of federal nanotechnology policy in the U.S. has been to foster collaboration among the scientific disciplines. As a result, over the past decade, scientists and policy makers have created a national infrastructure of academic centers, programs, and networks organized around the professed goal of stimulating interdisciplinary efforts. Yet, the extent to which this vision has been realized remains uncertain and has been a subject of scrutiny. As part of the broader goal of understanding the nature of contemporary interdisciplinary research, this essay contextualizes the question of interdisciplinarity in the emerging field of nanotechnology. It addresses why such a vision became a desired goal and how attempts to realize this have been translated into practice. This essay offers an analysis that highlights both the internal and external dynamics that have dialectically shaped the interdisciplinary nature of nanotechnology. It does this by exploring three important case studies in the history of nanotechnology. The first is the creation of a major university-funded research center at Rice University by Nobel laureate Richard E. Smalley in 1993. The other is the multi-year discourse in the late 1990s that led to the formation of the U.S.'s National Nanotechnology Initiative in 2000. The third example returns to Rice University and looks at how the concept and goal of interdisciplinary research has influenced the institutional lifespan of an NSF-funded nanoscience center. The essay concludes by reflecting on the persistent place that rhetoric and practice regarding interdisciplinary collaboration has had over the last 15 years of nanoscale research.

Two-Part Harmony: Nanotechnology's Early Communities of Support. *Patrick McCray, University of California, Santa Barbara*

Following the publication of _Engines of Creation_, Kim Eric Drexler's 1986 nanotechnology manifesto, a diverse range of pro-technology communities expressed great enthusiasm and support for his vision.This article explores the support and interest expressed by two very different groups, both of which have strong ties to California. One of these was the cryonics community - those individuals who advocated the preservation of one's body or brain at liquid nitrogen temperature in the hopes that future medical advances might be able to bring about revival.

The second pro-nanotech community was composed of people from Silicon Valley's extensive software and computer businesses. For example, Drexler had strong personal and professional ties with the Xanadu project, an infamous software project initiated by computer guru Theodor Holm Nelson in the 1970s and supported by Silicon Valley giant Autodesk in the 1980s. Both communities shared a belief that if miniaturization continued from the micro down to the nano, similar leaps in human biology and society were assured - downloading consciousness, radical life extension, completely realistic and inhabitable virtual environments. Inspired by a wish to improve society, these technology enthusiasts were also motivated by a desire to push radical new technologies, make a fortune, and overcome inherent biological limits. Both communities expressed enthusiasm for Drexler's radical vision, based on what he called "exploratory engineering," for what future advances in molecular engineering might allow for both life extension and computer design. The interest that the cryonics and computer science communities showed for nanotechnology as it was imagined in the 1980s set the stage for the emergence of the transhumanism movement in the 1990s. More recently, this same confluence of communities interested in nanotech, computers, and life-extension has come together to promote the idea of a technological Singularity. Using interviews, contemporary documents, and journalists' accounts as evidence, this talk explore how these two communities embraced and advocated radical visions for nanotechnology. I will also show how the public imagining of emerging technologies played a role in the shaping of official government policy for nanotechnology during the Clinton and Bush administrations as Drexler and his visions were cautiously supported and then marginalized.

Chair:

Hyungsub Choi, Chemical Heritage Foundation

078. Gender Studies

3:00 to 4:30 pm

5: 515

Participants:

Medical Migrations and Assisted Reproductive Technologies in Mumbai, India. *Daisy Deomampo, City University of New York, The Graduate Center*

This research examines the social, cultural, and policy implications of medical migration—briefly defined as the movement of people across national borders for health care—specifically for assisted reproductive technologies (ARTs). In recent years, India has emerged as a global "hub" for this kind of medical travel, in part because of lower costs but also due to minimal regulatory frameworks for the provision of ARTs. This paper explores the implications of such travel by asking the question: How does ART law and policy influence the growth of medical travel to India, and how do these transnational medical processes affect notions of kinship and family, gender and citizenship? This research considers medical travel for reproductive health care as a critical case study for understanding the procreative process in transnational contexts, as human reproduction increasingly involves collaborating actors in the lab, clinic, travel agency, and courtroom. At the same time, grounded in Mumbai, India, this project provides an important opportunity to examine how policy and legislation relate to the increasing numbers of couples—from the United States and around the world—traveling to India for ARTs. This paper is based on a preliminary analysis of data collected from eight months, to date, of fieldwork, part of a planned 18 months of dissertation fieldwork in India and the United States. I draw on data collected through participant observation, semi-structured interviews with the range of actors involved in medical travel to India for assisted reproduction, and analysis of popular representations of so-called "reproductive tourism" and ART policy debates in media and other public sources. This paper aims to make innovative contributions to science and technology studies, gender studies and medical anthropology by demonstrating how ART policy shapes and is shaped by ideologies of gender, kinship and motherhood, and, more broadly, by elucidating the complex relationship between creation of policy, uses of reproductive technology, and culture. By studying "on-the-ground" the diverse motivations and experiences of key actors involved in reproductive travel, this project aims to contribute to our understanding of assisted reproduction law and policy—in the U.S. and globally—from a social science perspective.

Objectification, Fascination, and Entrenched Gender: RealDolls, Honey Dolls, and Roxxxy in Social and Cultural Context. *Deborah Blizzard, Rochester Institute of Technology*

This paper investigates the ever growing industry of sex dolls and argues that as the dolls become more human-like we are apt to enter Hori's "Uncanny Valley" in which fantasy and reality blur and once through we may come to accept these dolls as representations of how the ideal woman should look and act. Within the last twenty years the development of sex dolls has not only become lucrative, but is entering popular culture at an astounding rate. In particular, the 2008 release of the Hollywood film, "Lars and the Real Girl," and the 2007 BBC documentary "Guys and [Real] dolls" have brought the dolls, and those who love and/or use them into public consciousness. In only a few decades the dolls have emerged from the 1996 rendition of the "RealDoll" in which the buyer selected a body and face (now ten different female body types and two male exist and sixteen female faces and three male exist) to a Japanese firm that took the doll one step closer to simulating human interaction. In an effort to have the doll "communicate" with the user, the "Honey Doll" expressed herself through a series of recorded audio. However, it was not until recently that a doll that could respond to its user was developed. In January 2010 the Sex Bot, "Roxxxy," from the program "True Companion," was unveiled at the Adult Entertainment Expo, Las Vegas. Touted as not only a toy, but with programming "she" could take on personalities and become a companion to her owner. Roxxxy is the next in a line of ever-increasing sex toys that are designed to mimic the human being (generally female) and to bring sexual experiences to the owner. While some may see these creations as a symbol of technological know-how and sexual freedom, others may see these mannequin style dolls as a challenge to the ironically "real" human. In fact the website of the company producing the RealDoll claims the following, "RealDolls are completely customizable, all the way down to the make up and fingernail colors. If you've ever dreamed of creating your ideal partner, then you have come to the right place." This paper argues that the concept of creating your ideal companion comes at a cultural and gendered price. What might it mean to multiple cultures when the human body can be objectified to the point that ordering one custom made is acceptable? And, though there are male sex bots (or some in the design phase) the female forms greatly out number the males. The shear diversity of female toys as opposed to the few males may suggest a further entrenchment of power inequities already noted in gender studies. The RealDoll, Honey Doll, and Roxxxy, lay at an intersection of sexual fulfillment, body objectification, and gender inequity. This article examines these themes and looks to a future in which such dolls may become "real" in lives of their owners.

Umbilical Cord Blood Banking, Women's Body, and Motherhood in South Korea. *Yeonbo Jeong, University of Minnesota*

This study explores the meanings of women's body and motherhood in the discourse around umbilical cord blood banking in South Korea. Umbilical cord blood was considered waste, but has become important because it can be used for the treatment for children with serious medical conditions such as leukemia. Since cord blood is less hard to donate and match compared to bone marrow, it can be used when one cannot find a suitable bone marrow donor. Cord blood has become valuable also as a raw material for stem cell research and "future medicine." Especially after Dr. Hwang's scandal about his problematic use of eggs for stem cell research, cord blood

emerged as an alternative source for stem cell research to eggs and embryos in South Korea. It is often said that stem cell research using cord blood is "free of ethical issues" in contrast to embryonic stem cell research. However, there are important bioethical and sociopolitical issues on cord blood banking and research. Cord blood banks say that there is no risk for baby and mother in collecting cord blood because it is harvested from the placenta and the umbilical cord "after birth." But the process of the extraction of the blood may well increase the length and risks of labor because the blood is captured in the third stage of labor when hemorrhaging and shock are most likely to occur. Even though the risk is not as high as in bone marrow donation in many cases, it is a problem that no information on the possible risks is given to women who consider storing or donating cord blood. Labor does not end for women before the placenta comes out. Seeing the birth completed only when the baby comes out can overlook women's health and experience. Both mother and baby should be considered importantly. Private banks' advertisement also emphasizes the importance of preserving the cord blood for baby's health and future, make it an imperative. Interviews with women show that some women feel guilty for not storing the cord blood for her baby. Storing cord blood costs 680000 to 1800000 won (680 to 1800 dollars) in South Korea. The price depends on periods of storage and equipments. Banking cord blood is a class issue, since the price is not affordable to everyone. In this context, the middle-class ideal of motherhood is reinforced. For this study I critically examine relevant governmental policies, advertisements, and media representations regarding cord blood banking. I also interview women who stored cord blood and scientists in the field. I build on the work of other scholars who have examined the supply and use of human bodily materials for newly emerging biotechnologies. This study will make a deeper understanding about gender in the new biotechnologies.

Gendering Science, Gendering Ethics: The Intersecting Production of Knowledge, Gender, and Ethical Issues. *Laurel Smith-Doerr, Boston University*; *Jennifer Croissant, University of Arizona*

This paper investigates how scientists think broadly about the ethical issues in their research field—including social justice issues in how research goals are developed—and how gender identity (and its intersection with nationality and race) is related to ethical approach. The paper approaches these issues of gender and ethics by examining them within the context of scientific knowledge production and narrowing institutionalization of research ethics rules. These questions about process and context are addressed with inductive, qualitative interview data. While assertions about women's propensity to do science for altruistic reasons are often made, the processes by which gender and ethical approaches to science are connected have not been investigated in a focused study as proposed here. In addition, the organizational contexts that are both gendered and produce pressures that shape research conduct are an object of interest. This paper will contribute to understanding of the gendered organization of science by investigating the limits to and possibilities for scientists to perform gender and science in a wider range of ways. The 'doing gender' perspective theorizes gender is a performance that falls along a wide spectrum of masculinity and femininity and corresponds to work roles. Research has looked at the ways organizational context shapes the performance of gender, and how race and nationality intersects with gender. These insights from sociology, however, have not been brought to bear on the ways that 'doing science'--from an STS perspective—is gendered. The product of scientists' work—knowledge—and the way that science is structured, funded, and evaluated create unique ethical dilemmas as well as a legacy of bias toward men and masculinity. How are these processes and outcomes related? Our interview data provide a basis for looking at scientists' and engineers' narratives about responsibilities/ethics and gender in their field—and the connections and gaps between discourses on responsibilities, organizational pressures, and gender identities.

079. Beyond the "Third Wave"

3:00 to 4:30 pm

5: 521

The "third wave" arguments have attracted wide, and occasionally critical, attention in STS and related fields. Now the temporary excitement centring around the arguments seems to have settled. At this stage the ordinary way of handling the arguments and the subsequent dispute might be to sum up what has been learnt from the questions posed (or what has not). What this session will set out to do differs from this way of proceeding in two respects: first, it will try to develop the question posed by the arguments still further rather than summing up something already discussed, and secondly, to that end, it will attempt to highlight two important implications of the questions raised in the dispute that seem to have been dismissed up to now and yet have a serious impact on STS. First, the session will focus on implications for the relationship between the third wave arguments and a sort of the blind spot of STS, particularly self-exemplifying implications for the credibility of the very foundation of STS and related fields since the implications seem to have escaped scholarly attention they deserve up to now. Secondly, implications for the relationship between the arguments and politics including participatory politics will be also taken up since the self-exemplifying implication mentioned above has significant implications for the "policy turn" of STS, and probably vice versa. Policy here includes both public policy from the top and various participatory ways of social decision-making. In a word, this session will try to disentangle the complex relationships between the third wave arguments, the scholarly foundation of STS, and politics in the science-technology-society interface. To achieve that end, two points are expected to be examined in the session. First, different ways of defining expertise, setting the boundaries of multiple expertise, and the relationship between one expertise and another will be discussed with reference to the following question: how and why are STSers are qualified to say something in the science-technology-society interface from a standpoint that is different from both scientists and engineers and the ordinary citizen? Secondly, the same question will be discussed with reference to various modes of "real politics" such as technocratic or participatory, or other ways of social decision-making which pertains to the quality of public sphere and democracy in a significant manner. What runs throughout the entire session is the realization that the problem of knowledge distribution cannot be self-contained in the sphere of knowledge alone since it is inextricably related to the allocation of responsibility for something collectively decided in the actual science-technology-society interface, be it the legitimate task of STS, or a site selection for nuclear waste disposal.

Participants:

The Third Wave: Looking Back and Looking Forward. *Harry Collins, Cardiff University*

In my presentation I will outline the current state of play in work inspired by the Third Wave idea. We are now in a position to separate this work into two streams. First there is the technical business of exploring the nature of expertise and exploiting new methods, both qualitative and quantitative, for its investigation. This technical part of the programme can be referred to as Studies of Expertise and Experience (SEE). I will outline where this programme has been and where it is going, setting out its latest results and its prospects for the future. The second kind of work is more general. It can be thought as associated with the Weltanschauung of the Third Wave. SEE, then, is the technical programme of the political approach known as the Third Wave. The political approach is aimed at justifying the scientific values at the heart of the natural sciences, bringing scientific values back to the centre-stage of social science, and looking at the possibility of building a good society with scientific values at its heart. All this is to be done without going back to what has been called Wave One of science studies and without rejecting the crucial discoveries of Wave Two. The trick of Wave Three is to make central, not science's findings? the province of Wave one ? nor the day-to-day practice of science ? the province of Wave Two ? but the values and aspirations of science. The broad political programme is called -elective modernism' and this will be explained. The way the Third Wave's political perspective bears upon the relationship of science and society will also be explained as will the way it varies from some interpretations of

the -participatory turn' in science policy.

Expertise, Publics and Politics: Waving at Meanings? *Brian Wynne, University of Lancaster*

Much of the voluminous social and political theory of expertise and authority, some of it from science and technology studies, while it has illuminated different categories and roles, has remained within a horizon which can be identified as instrumentalist. By this I mean that it seems to share the assumption that the fundamental point of such analysis is to understand how expertise 'works' as social practice and authority. While this is a perfectly legitimate and useful object in itself, my interest is to go further than this, and to understand how expertise in its different social-institutional and epistemic forms, comes to be invested - by its own practitioners or by other 'users', with implicit claims to authority which extend beyond its own specialist esoteric knowledge-base, and for example, ends up presumptively defining what other peoples' problem is. This could almost be summed up in the classical joke about nuclear energy - as a self-appointed mega-"solution", or techno-fix, looking for "the problem" from which it could ride to the rescue and save the world: "Nuclear power is the answer - but what was the question?" I will use some examples from post-war (1950s onwards) Western science and policy to show how scientific expertise is continually defined, ostensibly as essential informant of public policy; yet in practice it is given the further and fundamentally different public role, of defining what the policy question is whose (scientific) answer will provide the normative prescription as to which direction policy must choose. In other words, 'scientific expertise' has been by default, given a fundamentally different and extra role from informing policy with the as-far-as-possible correct propositional understandings, which is to provide the public meanings which define the salient propositional questions in the first place. This can be seen in the last decade or so to have extended seamlessly into a tendency to presume that for complex multivalent and technically-intensive public issues like (but not only) energy, climate, or food and agriculture, only technical questions and technical solutions are imaginable and meaningful contributions to policy. In this paper I will draw upon Hannah Arendt's political philosophy to suggest that once democracy has left citizens to have public meanings imposed on them by others, rather than to exercise the collective agency and responsibility to negotiate these for themselves, it has lost the plot for itself. Of course this collective - and likely, conflictual - negotiation of meanings should be as well-informed, and challenged, by salient expert propositional knowledge as it can be. This would require those bodies of expert knowledge which enjoy politically-assigned authority, to be open to questions as to their saliency relative to other forms of knowledge, as well as to their propositional rectitude alone. This would also - perhaps lethally -complicate prevailing models of "The Chain of Meaning and the Locus of Legitimate Interpretation" (Collins and Evans, 2007, p.120) in social studies of expertise.

Re-rethinking Expertise. *Steven Epstein, Northwestern University*

My presentation will critically examine recent approaches to the study of expertise and experience and their implications for collective political action in relation to science and technology. The goal will be excavate the latent and overt presuppositions of such approaches and to identify the broader political and epistemological stances to which they correspond. I am especially concerned with how such stances align with distinct conceptions of engagement, participation, mobilization, and democratization. At the same time, I will return to the burgeoning empirical literature on patient groups and health movements in an attempt to generate new ideas and clearer distinctions to help understand the diverse forms that lay/expert relationships may take. I will conclude by considering, in reflexive fashion, the implications of my analysis for STS as an expert domain.

Between Knowledge and Policy: The Politics and Practice of Social Translation. *Frank Fischer, Rutgers University*

The paper would examine the nexus between knowledge and policy. Following the line of argument developed in Democracy and Expertise, it would argue that there is no epistemological bridge across which knowledge can be moved into the policy arena. Instead, it requires a form of social translation that is missing from the Third Wave. Such translation would need to be worked out through collaborative interactions between experts and citizens. Toward this end, I call for a new subspecialty called "policy epistemology" designed to both better understand the nature of this translation and the kinds of the institutional practices that might facilitate it. The practice of translation is specified as a new role for policy science more generally.

The Underdetermination of Policy: Beyond the Underdetermination of Expertise. *Miwao Matsumoto, The University of Tokyo*

This paper argues that the questions posed by the third wave are important, interesting, and far-reaching but the solution suggested is only one of the broad and rich possibilities because the possibility having been sought up to now seems to fall within the bounds of the questions that are understood in a narrow scope sticking mostly to expertise alone. If the sociological extension of underdetermination is attempted, the legitimate task of STS could also be pursued in a completely different way based on the same problem situation. In particular if we can assert at least a well-specified sociological account of underdetermination of expertise including scientific knowledge, the assertion will enable us to open the door afresh to the sociological examination and assessment of the underdetermination of policy. This paper calls the underdetermination of scientific knowledge "type one underdetermination", and all other underdetermination involved in the entire process of policy making, implementation, and evaluation "type two underdetermination". The paper will illustrate this double underdetermination and focus on the clarification of the sociological implications involved in the "type two underdetermination" that has escaped the scholarly attention it deserves in the science-technology-society interface.

Chair:

Trevor Pinch, Cornell University

080. New Technology and Science Communication

3:00 to 4:30 pm

5: 522

Participants:

Politicization of American Beef: BSE, FTA, and Candlelight Demonstration. *HEE JE BAK, Kyung Hee University*

During the spring to the summer of 2008, Korea has witnessed nation-wide protests against imports of American beef. Among a million of participants in 2,298 demonstrations, 1,476 were booked and 42 were arrested. In this paper, I will draw both STS(especially Public Understanding of Science) and political sociology framework, to account for why the BSE became so big an issue in Korea. Although the appearing reason of the vigorous public protest was public concern over BSE with which American beef might be infected. STS, especially PUS, can help our understanding of Korean public's concern over American beef. Uncertainty of scientific knowledge of BSE, public trust in institutions of controlling risks, unrealistic social assumptions embedded in scientific estimation of BSE risks, and experts' neglect of scientific capability of the public all contributed much to Korean's skepticism against the safety of American beef. It could not explain, however, why Korea has experienced unprecedented strong protests which were much more vehement than the cases of other countries. In order to get a full picture, we should understand why the BSE issue could become politicized at that time in Korea. Although the BSE was a risk issue representing a new life politics or sub-politics at first, it soon became an old political issue dividing publics into conservatives and liberals in Korea. The transition to conservative governments in 2008 after 10 years' of liberal governments created (unfortunate) political opportunity to make the case of importing

American beef a political incident. Both the conservative and liberal sides interpreted scientific evidence according to their interests. In so doing, the extreme claims-American beef was completely safe or it was extremely dangerous-prevailed and adopted by each side and there was no room for middle ground. Instead of providing with a final verdict or a relevant basis of decision making, science in this situation could only be a resource mobilized for political claims and showed well how it would be opened to public interpretation. Literature reviews, including new paper articles and TV news and document program scripts, and interviews are used for this research.

The Self-Portrait of Post-War Japan and Images of the Nuclear Power. *Hirofumi Utsumi, Otemon Gakuin University*

The present paper discusses the transformation of images on nuclear power between 1945 and 1965 in post-war Japan. The main material for my analysis was the Japanese weekly graph journal called "Asahigraph" that was the first illustrated magazine featuring the damages by atomic bombs in Hiroshima and Nagasaki. Through an analysis of Asahigraph, this paper demonstrates that the images on nuclear power were strongly related with the reformation of the national self-portrait in post-war Japan. The transition of the images on nuclear power can be divided into three stages. The first stage was during the occupation period between 1945 and 1952. In this period, there were a few articles written on nuclear power in Asahigraph. This period of time was characterized by the limited information about atomic bombs, and also by the general optimism on science and technology including nuclear power. The second stage was right after the end of the occupation. In 1952, Asahigraph published numerous pictures about the damages caused by the two atomic bombs in Hiroshima and Nagasaki. It was the first time that Japanese people got terrible visual images of the atomic bomb. The Lucky Dragon Incident (Daigo Fukuryuu Maru Jiken)" in 1954 settled these terrible images. The fear against the invisible "radiation" created an image of nuclear weapons that do serious harms without being bombed directly. After the incident, Asahigraph began to report again and again about the atomic and hydrogen bomb tests in foreign countries. On the other hand, Asahigraph also started to report about the strong international competition over nuclear power plants/reactors as well as Japan's backwardness in this competition from the mid 1950s. The third stage in the 1960s was characterized with several reports about new trend of "atoms for peace". At the same time, there were also reports about "atoms for war", not only the atomic and hydrogen bombs but also nuclear submarines. The image of nuclear submarines was not only related with the fear of radiation, but also the relationship with the US. In addition, the reports related with Hiroshima and Nagasaki began to change the nuance:"Hiroshima/Nagasaki" was moving to the past. It was the time when"Hiroshima/Nagasaki" was memorized as a scene in the national history. The contrast between the military and non-military use in the images on nuclear power between the late 1950s and early 1960s was deeply linked with the establishment of post-war Japan's self-portrait. That is,"atoms for war" as a "bad thing" was positioned into the past and 'outside', and "atoms for peace" as a "good thing" was placed into the present and 'inside'. This imagination was an expression of the then national self-portrait that Japan managed to overcome the defeat represented by "Hiroshima/Nagasaki" and the "US". The self-portrait did not mean the settlement of the problems after the defeat. It might be said that we are living under the similar conditions of nuclear power established in the early 1960s.

A preliminary survey toward a better science communication of neurosciences. *Itaru Takeshita, Nagoya University*; *Ken INOUE, Nagoya University*; *Kazuhisa Todayama, Nagoya University*

Background For an effective science communication, specialists or interpreters should beforehand know what non-specialists or those who receive the information know about concerned subjects. This applies to any fields in science, and it does even more to neurosciences. For, in Japan, students are provided with very little knowledge about the brain during their elementary and secondary education and the only source of their knowledge of the field is confined to their voluntary learning. In addition it seems that some popular science books, which are intended for non-specialists, contain misleading (or sometimes wrong) explanations. Aim and method With these facts in mind, we attempted to examine two points listed below, as a preliminary study for aiming at healthy science communication. 1 What people who haven't voluntarily learned the subject know about the brain 2 What popular science books in general tell about the brain and common misunderstandings they show With regard to the first question, we examined high school textbooks of biology and the Education Ministry guidelines, which define the contents of them. With regard to the second, we picked up the 10 best-selling books for past ten years which treated the brain as the subject matter. The reason why we examined the guidelines and the textbooks is that these show the virtual minimum standard of education in Japan. Major findings and arguments Firstly the guidelines explicitly dictate that high school textbooks should not detail both the anatomy and function of nervous systems, therefore they show students very little information about them. In the second place, popular books designed for ordinary people not so much introduce the results of scientific research, as utilize some of them to support the author's own opinion on (especially early) education, popularized "psychology", etc. In many cases they also contain highly misleading descriptions, which we classified into three categories: 1) misleading explanation of sexual differences in intellectual capacity in terms of brain differences, 2) hyperbole of hemisphere localization, and 3) naïve interpretation of brain images. It appears that a lot of people are concerned with the brain because of various interest. However, sensational and therefore inaccurate books are likely to give laypersons misunderstanding rather than understanding because of the lack of formal education of brain science These findings suggest that in order to realize good science communication, knowledge providers at outreach or media work need to take into consideration that ordinary people may already have incorrect knowledge and understand in what way their knowledge is biased. For example, it will serve smooth communication for communicators to learn common misunderstandings about neurosciences, some of which are shown in this survey. Contribution to the STS literature The preliminary survey conducted here will serve as material for establishing a better science communication.

The role of philosophy as an interface between neuroscience and the society. *Ken INOUE, Nagoya University*; *Hidenori Suzuki, Nagoya University*; *Kazuhisa Todayama, Nagoya University*

Backgrounds What contribution can philosophy make to realize a desirable relation between neuroscience and the society? One way to contribute is to participate in neuroethics, and actually it begins to be done. However, there remains basic work which should be addressed before the consideration of ethical problems. This "basic work" consists of two tasks. One is to treat epistemic and methodological questions, such as "To what extent can we say we can tell something from these data?". The other is to deal with conceptual problems, such as "Assuming that we can tell these things, what implications should we think these results have on ourselves?". In this presentation, we carry out "epistemology of brain images" as the first task and "analysis of ordinary concepts" as the second. Aims and method (1)Epistemology of brain images What do brain images tell us actually? Certainly it is claimed in the report of experimental results that "a correlation was found between a mental activity which the experimenter concerned and the brain activity in region ○○", but the meaning of brain images obtained is not always clear. It should be made clear "what conclusions can be drawn from brain images actually", by taking into account such things as: limitations on the performance of a measuring device, principles of measurement, methodological assumptions. (2)Analysis of

ordinary concepts It has been often claimed that a brain research has some implications on "free will" or "moral responsibility". However, scientists may use such terms following their folk intuitions. If such is the case, even if their experimental results were right, the conclusions on "free will" or "moral responsibility" would be inevitably dubious. And given that free will and moral responsibility are among what we take for granted in our ordinary life, the judgment about them has to be done with care. Since philosophy is a field which has been specialized in conceptual analysis, philosophers can make contributions in this point. The meta-viewpoints to consider relations among empirical findings, philosophical theories, and ordinary intuitions, will be also required to establish a better relationship between neuroscience and the society. Major findings ・By worrying in advance, ethicists may fan public fears on the contrary. It is necessary to evaluate techniques accurately. ・As brain images have various methodological problems, we can know only robust cognitive processes. ・Neurological determinism threatens free will only if we take incompatibilist position. ・The thesis that "Moral responsibility requires free will" is not unquestionable one. ・If ordinary intuitions are equivocate or inconsistent with the scientific world picture, we may revise them according to empirical findings. Contribution to the STS literature In this presentation, through above two basic tasks, we offer the opinion about the role that philosophy can and should play as an interface between neuroscience and the society.

081. Science and Gender

3:00 to 4:30 pm

5: 523

This session will focus on gender problems which female researchers in science and technology face. The first three speakers will discuss female researchers according to their process of career establishment. The last speaker will discuss the exposure of female scientists and engineers in museums. These reports will contribute to the elucidation of gender problems in human resources. We will invite Prof. Tsai as discussant. 'Choice and Confusion' of High School girls in Japan Ginko KAWANO (Yamagata University) The results of TIMSS and PISA show that Japanese girls and boys in primary and junior high school are rated highly compared to international standards. However, there are few female students in science-related fields in universities. Therefore, we have to make clear what happens through high school education, especially details of students' choosing the humanities or sciences. I will give an outline of the questionnaire, which I conducted in 2004. My suggestion from this research is that we need to provide high school girls with enough support when choosing their courses and reconsider the course selection framework itself. Current Problems for Female researchers in Japan Mariko OGAWA (Mie University) I will illustrate the situation for female researchers in Japan using line graphs which deal with horizontal and vertical segregation. In addition, I will draw attention to a problem that has arisen with the increase of female researchers known as the "Dual-Career Academic Couple Problems." In the United States, many universities routinely grapple with this problem but in Japan its significance has not yet been fully recognized. If universities and research institutes are keen to give female researchers a chance to fulfill their abilities, it would not be advisable to allow this problem to continue unchecked. Trend of the Scientific Careers in Japan -Female-specific Problems Yukiko MIURA (RCAST/Univ. of Tokyo) Some recent social problems in Japan might be caused by unbalanced supply and demand of human resources in science and technology (HRST). One reason could be the lack of positive actions for gender-equality in the science and technology fields. Therefore, several years ago, some policy programs to promote the activity of women in science and technology fields started. I will consider the scientific careers and problems for female scientists using analysis of the HRST labor market and the related policies. Female Scientists and Engineers Exhibited in Science Museums Kae TAKARABE (Chubu University) Science museums play a role in enhancing public understanding of science and technology. The Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation, at the Smithsonian Institution's National Museum of American History, was established in 1995 and has documented topics, such as female inventers, to which former documentation seems to have paid little attention. The author will examine how the center chooses and documents such topics and then makes science communication. The focus will be on the female scientists and engineers exhibited by the center. The author will also refer to the present conditions of the female scientists and engineers exhibited in Japanese science museums.

Participants:

'Choice and Confusion' of High School Girls in Japan. *Ginko KAWANO, Yamagata University*

The results of TIMSS and PISA show that Japanese girls and boys in primary and junior high school are rated highly compared to international standards. However, there are few female students in science-related fields in universities. Therefore, we have to make clear what happens through high school education, especially details of students' choosing the humanities or sciences. I will give an outline of the questionnaire, which I conducted in 2004. My suggestion from this research is that we need to provide high school girls with enough support when choosing their courses and reconsider the course selection framework itself.

Current Problems for Female researchers in Japan. *Mariko OGAWA, Mie University*

I will illustrate the situation for female researchers in Japan using line graphs which deal with horizontal and vertical segregation. In addition, I will draw attention to a problem that has arisen with the increase of female researchers known as the "Dual-Career Academic Couple Problems." In the United States, many universities routinely grapple with this problem but in Japan its significance has not yet been fully recognized. If universities and research institutes are keen to give female researchers a chance to fulfill their abilities, it would not be advisable to allow this problem to continue unchecked.

Trend of the Scientific Careers in Japan -Female-specific Problems. *Yukiko MIURA, University of Tokyo*

Some recent social problems in Japan might be caused by unbalanced supply and demand of human resources in science and technology (HRST). One reason could be the lack of positive actions for gender-equality in the science and technology fields. Therefore, several years ago, some policy programs to promote the activity of women in science and technology fields started. I will consider the scientific careers and problems for female scientists using analysis of the HRST labor market and the related policies.

Female Scientists and Engineers Exhibited in Science Museums. *Kae TAKARABE, Chubu University*

Science museums play a role in enhancing public understanding of science and technology. The Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation, at the Smithsonian Institution's National Museum of American History, was established in 1995 and has documented topics, such as female inventers, to which former documentation seems to have paid little attention. The author will examine how the center chooses and documents such topics and then makes science communication. The focus will be on the female scientists and engineers exhibited by the center. The author will also refer to the present conditions of the female scientists and engineers exhibited in Japanese science museums.

Discussant:

Li-Ling Tsai, National Kaohsiung Normal University

082. Reframing Rights: Bio-constitutionalism in the Genetic Age

3:00 to 4:30 pm

5: 524

This session looks at bio-constitutionalism: the concurrent evolution of the biosciences and biotechnologies together with changes in the constitutional status of individuals and other morally significant biological entities. Modern biology crosses conceptual boundaries that have long been basic to legal thought—between life and non-life, human and non-human, individual and collective, predictable and non-predictable. These crossings and transgressions entail corresponding realignments in the perceived rights, duties, and entitlements of living beings, as well as in the institutions

of governance that interpret and implement these norms. The notion of bio-constitutionalism captures the transformative nature of these shifts, which have redefined foundational legal, ethical, and moral commitments so as to accommodate far-reaching scientific redescriptions of life itself. Through a series of national and cross-national case studies, presenters show how answers to normative questions regarding an entity's rights and obligations depend on answers to ontological questions about the nature of the entity itself. Bio-constitutionalism thus emerges as a significant mode of co-production. The concept contributes to STS studies of the normative dimension of scientific and technological innovation by theorizing and illustrating how, in times of change, both old and new biological entities are inscribed into legal frameworks of rights and responsibilities.

Participants:

"Between Church and State: Stem Cells, Embryos and Citizens in Italian Politics". *Ingrid Metzler, Life-Science-Governance Research Platform, University of Vienna*

This paper tries to make sense of a larger bio-constitutional project in Italy, using the politics of human embryonic stem cell (hESC) research as a window through which this can be studied. It first discusses the "norms in the matter of medically assisted procreation" which the Italian Parliament passed in 2004. It argues that in this law Parliament redefined the collective of Italian citizen subjects, inscribing the status of IVF embryos as "quasi-citizens" into law. Embryos that used to be under the jurisdiction of medical professionals and prospective parents were withdrawn from their control and put under the guardianship of the state—they were effectively "nationalized." Yet while the nationalization of Italian embryos restricted the material of Italian hESC research, it set the conditions for their public proliferation. Indeed, after the enactment of the law hESCs became the signifiers of a battle for rights and liberties against an oppressive state and its Roman Catholic ally. This battle peaked in a nation-wide referendum in June 2005, in which Italy's voting citizens were asked whether they wanted to modify the law in such a way as to remove many of its restrictions on human embryonic stem cell (hESC) research. The paper unpacks these debates and argues that these did not only involve the question of whether Italy should endorse hESC research or not; these were also entangled with more constitutional debates that put the very categories of the Italian polity at stake, opening questions such as who belonged to the community of Italian citizen subjects and what kind of state they should be subjects of. In sum, this paper argues that Italy's soul searching on how to come to terms with hESC research took shape from the flipside of a larger bio-constitutional debate and addressed questions about what life is and what it should be, about who is allowed to speak and act on it, and about the appropriate places of law, the state and the Church in all of that.

"The Making of the Clones". *Giuseppe Testa, European Institute of Oncology*

This comparative study analyses three defining moments in the emergence of cloned cells as socially legitimate scientific objects: the decision of the British House of Lords (HL) in 2003, the proceedings of the Italian Dulbecco Commission (DC) in 2000, and the proposal developed by the US President's Council on Bioethics (PBC) in 2004 to overcome the ban on public funding for human cloning. The aim is to gain insight into the practices through which science and society engage in the simultaneous production of knowledge and social norms (including constitutional rights), and how they go about ordering new living things within existing or yet to be invented categories. The three cases took place in different institutions and discourses, but each has specific significance in the cloning debate and each points to different modalities of co-production. Indeed, it is precisely the juxtaposition of their differences and similarities that highlights how political cultures (their historical constraints, their discursive resources and their ways of distributing and recognizing expertise) are integral to the development of technoscientific objects. In reverse, the same empirical analysis shows how the encounter with scientific objects, and the need to articulate their public meanings, are "moments of truth" in which political cultures affirm, discover, or indeed reinvent the sources of their legitimation. The allegedly same object - the cloned cell - was framed in different ways and granted a different ontological and legal status in the three cultures we examine. But comparison reveals that this diverse ordering did not result from a confrontation between a predefined object and equally predefined legal and ethical principles that could either accept or reject it. Preexisting instead were institutional features and conceptual resources, on both the technoscientific and the legal-political side. And this work traces how those features and resources were aligned, in three different political cultures, on the basis of different conceptions of what counts as natural and good, and of how we come to recognize either. These different conceptions guided then the emergence of three constitutional dispensations that differentially enabled, or disabled, the public circulation of clones.

"Constituting Life, Imagining Democracy: the Metaphysics and Politics of Human Cloning in the United States". *Ben Hurlbut, Harvard University*

The announcement of the first successful cloning of an adult mammal in 1997 touched off a fierce controversy in the United States about the application of the technique to human materials. This paper will examine the debates in the US Congress and in two federal bioethics bodies between 1997 and 2003. Conflicts over normative and regulatory issues came to center on ontological questions about what sorts of entities are produced through somatic cell nuclear transfer (SCNT or cloning). I will show how these ontological questions became central to ethical assessments of the products of SCNT; and, further, how ontological uncertainties were used to challenge claims to moral certainty as ungrounded and thus unreasonable. I will argue that, in the United States, this bio-constitutional moment became an occasion for reimagining the forms of democracy necessary for producing reasonable public policy around novel biological entities. In other words, the bio-constitutional features of the cloning debate centrally involved the construction of an imaginary of the right relations between science, state and citizens: relations that could ostensibly produce morally unproblematic science together with properly reasoned democratic deliberation. Differing ontological accounts thus became a vehicle for advancing competing visions of democratic deliberation. In turn, this emphasis on the settlement of ontological issues gave scientific experts a privileged role as judges of the tenability of particular moral claims. Put in bio-constitutional terms, scientists acquired, or asserted, a right to set the terms of discourse in which moral and ethical arguments could be deliberated.

"Property Rights, or Property versus Rights? : Questions in the Constitution of Contemporary Indian Biomedicine". *Kaushik Sunder Rajan, University of Chicago*

In this paper, I explore the problematic of "Reframing Rights" through the question of property, specifically intellectual property, in contemporary Indian biomedicine. I am interested in two articulations of rights in relation to property. The first is in the valorization of property itself in terms of rights, as seen in the current aggressive push on the part of the Indian government both to comply with WTO-mandated property regimes and to legislatively reorient the conduct of Indian science in a manner that is more conducive to the generation of intellectual property rights. The second is an opposition of property to other kinds of rights (such as right to health or right to life), which is emerging as an important form of political and legal response to property regimes in India. The co-production of global biomedicine with global political economy brings into being forms of what Sheila Jasanoff has referred to in her Introduction to the forthcoming volume Reframing Rights as "bio-constitutionalism". I wish in this paper to conceptually and empirically unpack an instance of the operation of bio-constitutionalism. Conceptually, I am interested in asking how the notion of "right" comes to be at stake and potentially refigured, when it becomes an instrument that both instantiates and negates property. Empirically, I am

interested in the institutional forms and political discourses, ideologies and actions that are mobilized at a moment when the very value systems of science, healthcare, the state, law and advocacy are simultaneously being reframed because of new developments in the life sciences and new multilateral trade arrangements.

Chair:

Sheila Jasanoff, Harvard University

Discussant:

Mariachiara Tallacchini, Catholic University of Milan-Piacenza

083. STS, Sustainability & Decision-Making about the Mid to Distant Future

3:00 to 4:30 pm

5: 531

Environmental problems, pursuing an agenda of sustainable development, and managing trajectories of emerging technologies such as nanotechnology and synthetic biology collectively challenge decision making capacity that has been oriented toward the near future. Much STS work on environmental and technological decision-making also has focused on the near term. However, we increasingly face environmental, sustainability, and technological problems and possibilities that require decision making and planning for the mid to distant future. This time frame may range anywhere from 20-30 years in the future, as is often relevant to emerging technologies, to 100-200 years (or longer) as is relevant to some environmental problems such as global climate change. The challenge of developing conceptual tools for systematically thinking about and analyzing developments for mid to distant futures is newly emerging in science and technology studies, as it also is in neighboring fields such as sustainability science, philosophical ethics, and economics. One example involves conceptual work on constructing plausible socio-technical or socio-environmental futures. Another example is research and analysis in economics and ethics on discounting deep future benefits of climate change policies. This session explores STS contributions to thinking about this scale of decision-making. Papers vary between those that advance STS methodologies and concepts that might improve decision-making for mid to distant futures and those that critically analyze existing methodologies and concepts used for this scale in other sciences. The papers focus on different cases including global climate change, nanotechnology, and synthetic biology. They also include discussion of such methods and concepts as scenario analysis, plausibility, and economic discounting.

Participants:

Designing Long Term Change. *John Grin, University of Amsterdam*

This paper will start with briefly presenting the multi-level pespective (MLP) for socio-technical transitions, and the notion of visioning. (Rip & Kemp, 1998; Schot, 1998) This perspective has emerged from STS, especially from the hoistory of technology, innovation studies and evolutionary theory. Several authors have claimed that the MLP untill now has been used for understanding transitions at the supply side. This objection is not unjustified. Another problem is that it tends to focus on one domain, e.g. agriculture or automobility. This paper seeks to build on the MLP so as to deal with these criticisms. As an empirical referent, I will discuss the historical case of modernization of food production and consumption. More specifically, I will show how transitions at the supply and the demand side reinforced each other; and how the transition of agricultural productiomn and rural water management went hand in hand. Drawing on the findings of this empirical anaoysis as well as earlier work (Grin, 2008), in which I conceptually argued how the MLP might be used as basis for the design I will eventually attempt to provide some guidelines for the design of strategies for long term, sustainable change. References * Grin, John (2008). 'The Multi-Level Perspective and the design of system innovations', chapter 3 (p. 47-80) in: J.C.J.M. van den Bergh & F. Bruinsma (eds. in association with R. Vreeker & A. Idenburg), Managing the transition to renewable energy: theory and macro-regional practice. Cheltenham, UK: Edward Elgar Publishing. * Rip, Arie & René Kemp (1998). 'Technological change', p. 327-399 in : Steve Rayner & Elizabeth L. Malone (red.), Human choice and climate change. Columbus, Ohio: Batelle Press. * Schot, Johan (1998). 'The usefulness of evolutionary models for explaining innovation. The case of the Netherlands in the nineteenth century', History and Technology, vol. 14, p. 173-200.

Economic Discounting of Climate Change Policy: What this Controversy Offers as an Example of Deep-Future Environmental Decision-making. *Stephen Zehr, University of Southern Indiana*

Economic analyses of policies to reduce greenhouse gas emissions generally discount the value of future benefits of reduced greenhouse gas buildup. Since costs would be imposed in the near term with many benefits accruing only in the distant future, the value of the benefits are often discounted due to foregone capital opportunity benefits and assumed greater future wealth. Due to the distant future time horizon, economists have yet to settle on an appropriate discount rate or whether any discount rate at all is appropriate. Perhaps because of consequentiality of the controversy, ethicists also have entered into the discussion. This paper empirically presents the different interpretations of discounting climate change policy as they have emerged in the economics and philosophical communities. It then empirically examines how the controversy has been closed off and often constructed as irrelevant on occasions where it could easily be inserted into policy deliberations. The presentation focuses on U.S. policy deliberations, using Congressional hearings as the research site. It emphasizes the development of hybrid frames that draw upon lay knowledge and deeply rooted, but discursively available, values. The presentation then considers whether and how the management of this controversy may serve as a useful exemplar for social studies of science examinations of controversial aspects of decision making in other environmental sustainability areas.

Science, Risk, and Democracy -- The Case of India. *Ravi Rajan, University of California, Santa Cruz*

During the past decade, scholarship in the field of Science and Technology Studies (STS) has contributed greatly to our understanding of the interface of risk, science, and democracy. Most of this literature is however on the advanced industrial nations of North America and Western Europe, with little of note on democracies in the developing world. The proposed research project will address this gap by focusing on India, the largest democracy in the third world. It has two parts. Firstly, it will examine three recent controversies that cast light on the social, economic and political contexts that drive the interactions between scientific knowledge, expertise, policy making and implementation in that context. These controversies are about: a) the processes of environmental impact and hazard analysis in India (studied with the case of the decision about siting a large dam (Tehri) in a seismic Himalayan region); b) policy making on chronic environmental risks such as pollution (approached through the case of the CNG controversy in Delhi); and c) regulating emergent risks (addressed via the case of Bt Cotton controversy).

Knowledge Limits in Sustainability Decision-making? The Case of Synthetic Biology. *Eleonore Pauwels, Woodrow Wilson Center for International Scholars*

At the end of the nineties, visionary minds from STS and environment studies started to take precedence over the diagnosis that science is not responding adequately to the challenges of our times, and particularly, those posed by the quest for sustainable development. Recognizing the need for a new "Social Contract for Science", they essentially identified three types of challenges - ontological, epistemological and normative - that societies of the future would have to cope with. Building on this diagnosis, STS scholars have begun to address the question of how sustainability is apprehended within the functioning of socio-technical systems with a subsequent focus on how these systems cope with their inherent ambiguities, uncertainties and

vulnerabilities. The contribution of STS to reflect on these ontological, epistemological and normative challenges has spanned from critical analyses of our knowledge production and knowledge assessment systems to empirical models to reforming these systems. Critical analyses of how knowledge systems work and how they are integrated with decision-making have progressively revealed the social and political arrangements that prevail into knowledge and production assessment, the opportunities for opening up these processes to alternatives, and the pathologies of closing up. They have contributed to deconstruct the values, framings and practices at stake in controversies over sustainability. Some trends in STS have also started to develop empirical methodologies that are capable of guiding decision-making toward visualizations and framings that endorse multiple and varied values. These STS researchers have begun to reflect on models for engaging civil society actors and wider publics in processes of envisioning and assessing technological futures. Overall, the STS contribution to sustainability research has been to expose some of the "sustainability matter of concern". However, when it comes to "sustainability matter of concern", the question of our collective ignorance might be as interesting as the question of our systems of production of knowledge. Interestingly, the question of our ignorance - meaning the non-production of knowledge - has often been left behind. What are the epistemic, social and political rationales behind our socio-ecological and socio-technical ignorance? In the face of sustainability challenges, there might a crucial need to problematize the sociological roots of the dynamics that lead to non production of knowledge about what we are supposed to "sustain". Building on the findings of an international research project at the crossroad between STS, sustainability science and a "sustainability technology" like synthetic biology, our contribution intends to identify the areas of ignorance in the reflection about how synthetic biology might contribute to sustainability but also raise new challenges in terms of sustainability. Another question might be why some sustainability questions are targeted by synthetic biology practitioners and some are not. Which areas are prioritised for scientific enquiry and under what incentives and constraints? What are the narratives behind these research trajectories? Finally, we will draw preliminary conclusions on how these areas of ignorance might impact decision-making about the future of synthetic biology and about our ability to make it a "matter of concern."

Plausibilistic Reasoning in Nanotech Futuring. *Cynthia Selin, Arizona State University*

Choices about emerging technologies are tricky due to the Collingridge dilemma: outcomes cannot be predicted until a technology is adopted, yet once path dependencies materialize and technologies get "locked in", control or modulation becomes difficult as rigidities in markets, cultural values, institutions and policy form. Confronting this dilemma to responsibly govern the outcomes of technological endeavors involves creating space for discerning dialogue, generating options, and setting priorities upstream. Future-oriented research and practices, like scenario planning, which have proliferated in the past century, have the potential to generate more socially robust and resilient solutions to complex problems. Such production and consumption of anticipatory knowledge is bound up in imagination and speculation, the analytic treatment of expectations, the creation of visions and predictive models - a whole range of practices, methods and tools. However, there is little systematic scholarship that addresses how such knowledge is used in policy, industry and academia and, more importantly, little said about the quality of such knowledge and its relevance for decision-making. Plausibility has emerged as a crucial yet under-examined concept that critically addresses the conceptual and methodological underpinnings of future-oriented practices. Anticipatory knowledge trespasses from fact to something else. In lieu of evidence and retrospective empirical studies, plausibility becomes a central concept to address issues surrounding the rigor and relevance of anticipatory knowledge. In the futures research community, plausibility is juxtaposed against such concepts as possibility (a range of options without judgment), probability (quantifying uncertainties), and desirability (preferred options). We may situate plausibility as a reasoned verdict - yet one that is often made with little reflection on norms, power or philosophical underpinnings. Beginning from an interdisciplinary survey of the literature of concepts akin to plausibility (trust, probability, prediction), this research examines the ways in which nano-scale scientists and engineers assess plausibility. This article reports on a survey conducted around nanotechnology, energy and equity where specialized nano-scale scientists and engineers were asked to critique future energy applications. They were specifically asked about their hopes and concerns, the feasibility of the technology and on what basis they judgment the plausibility of the futuristic scenario. The survey results are thus a preliminary step towards unraveling the crafting of plausibility and how one scientific community approaches an assessment of future potential. In this way, it provides an empirical grounding from which to further complicate our notions of uncertainty in science. This research into plausibility a step towards sophisticating future-oriented methodologies by clarifying issues of knowledge quality and the "knowability" of futures. In this way, uncertainty as a problem for social science writ large is tempered through attention to the epistemological and ontological status of the future, as articulated by a discrete group of scientists.

Chair:

Eleonore Pauwels, Woodrow Wilson Center for International Scholars

084. Medi/c/a Dystopia? : Media Representation of Bio/Medical Technologies in Modern East Asia

3:00 to 4:30 pm

5: 532

This session deals with media representations of bio/medical technologies in modern East Asia which include abortion-inducing methods and medical cosmetology in Taiwan, stem cell research in Japan, and plastic surgery in Korea. The first speaker, comparing media representations of drugs versus operations to induce abortion in Taiwan from 1945 to 1984, shows how risks of abortion have changed with time. The second presentation focuses on changes in the ethical/social framing of Japanese mass-media after the Hwang scandal and the appearance of iPS (human induced pluripotent stem cell). The third presenter investigates how marketing strategies worked through the media to convert potential consumers into health consumers of lifestyle medicine in contemporary Taiwan. The last talk traces how plastic surgery has been represented in Korean newspapers since the 1960's and elaborates five phases through which Korea has become "the Republic of Plastic Surgery." The rationales for this session are embedded in the title "Medi/c/a Dystopia." It intends to be read as both "Media Dystopia" and "Medica (Medicine) Dystopia" which implies that modern (East Asian) societies are built on/by media as well as bio/medicine. First of all, this session covers main issues on bio/medical technologies in modern world such as risk discourse, ELSI, subject-making, commercialization and globalization. It also exposes different assumptions and perspectives on the media's role such as "to circulate related information," "to reflect and effect directions of social discussion," "to strategically change consumers' actions," and "to take part in a whole network construction." "Medi/c/a Dystopia?" means to rethink the past, present, and future of bio/medical technologies through their media images as well as to reconsider social roles of the media in developing bio/medical technologies in modern East Asia. Last, this session is expected to make valuable contributions to enriching East Asian Science & Technology Studies (East Asian STS) as well as understanding East Asian Science & Technology (East Asian S&T) by focusing on East Asian bio/medical cases. Bio/medical technologies discussed in this session are woven with diverse and contingent contexts of Korean, Japanese, and Taiwanese societies. Therefore, studies on media representation of East Asian bio/medical technologies in this session deepen understandings of East Asian societies and strengthen East Asian STS scholarship. What concerns this session, however, goes beyond how the media make public images or social realities of bio/medical technology in those countries. This session not only asks questions of East Asian S&T like "how do modern East Asian societies construct bio/medical

technologies?" and "how bio/medical technologies construct modern East Asian societies?" but also gives an opportunity to reflect on East Asian STS's identities and directions. Since the overarching theme of the conference is "STS in Global Contexts," this session nicely fits into it, by offering vivid examples and fascinating insights into S&T and STS in East Asian contexts.

Participants:

Social/Ethical Framings in Japanese News-Media on Stem Cell. *Ryuma Shineha, Kyoto University*

Researches on "Stem cell" and its application have been progressed rapidly in recent years. However, the development of stem cell research, particularly human stem cell researches, coincides with the serious ethical, legal, and social issues (ELSI) such as destruction of human embryo, offering ova, and its impact on definition of human being and society. Particularly, topics concerning destruction of human embryo and offering egg by women was regarded as serious ethical problem, because they relates to definitions of the human being, values, and individual body and contexts. Concerning stem cell research, many ones may remember the fabrication scandal by Hwang Useok. However, remind that one of the most important ELSI of his scandal was the enforcement of egg. It will offer recognition that stem cell research related to both of individual contexts. So, stem cell research, the collective techniques generated by the scientific community, related to the problem on individual body and social context. More currently, a new variety of stem cells, "human induced pluripotent stem cell (iPS cell)" made by Japanese and American researchers in 2007 has become a prominent existence in the current bio/medical science, and also spread as a big news to the public society. Surprisingly, a current study show that the over 70 percent of the Japanese public recognize iPS cell, and over eighty-five percent recognize regenerative medicine. It seems that this indicates the potential of high recognition and debates. At the same time, however, it is easy to imagine that the appearance of iPS cell may impact on the ethical and social framing of stem cell research in the public discourse sphere. Because, although iPS cell may cause new type ELSI, iPS cell is anticipated to avoid the past ethical issues such as destruction of human embryo, offering egg, and damages to women body at least. In Japanese contexts, the occurrence of Hwang scandal and iPS cell seems to be a trigger for the public to look at the ELSI of stem cell research such as destruction of human embryo, offering egg, and so on. And the ethical and social framing concerning stem cell will be reflected to mass-media discourses. While mass-media effects a direction of social discussions (agenda setting), including ELSI topics. Thus, analysis of mass-media will offer insights on the current discussion in the public sphere concerning ethical and social framing of stem cell research. In other words, it can be said that this presentation focuses on how the stem cell topic including offering egg and destruction of embryo that relates to individual body and values has been treated in mass-media. Particularly, I would like to focuses on the change of discourses and ethical/social framing of mass-media after the Hwang scandal and the appearance of iPS cell in Japanese mass-media.

From Signification to Medicalization: A Discourse Analysis of Marketing Strategy for Medical cosmetology in Taiwan. *Kanlin Hsu, National Cheng-Kung University*

Against the rising critique of "false beauty image" imposed by the fashion and performance circles upon the public, medical cosmetology is emerging as a "promising" solution to conform the standardized body. However, analyses have been focusing upon the perfect body to be achieved rather than on imperfect body to be modified. Though thought to be medical response to existing social needs, medical cosmetology remain dependent on various marketing strategies to convert potential consumers into health consumers. Drawing on analysis of marketing discourses in news, Yahoo Answers and major health websites, this paper investigates the marketing strategy of medical cosmetology. The author argues that various product placements have been an important strategy for marketing medical cosmetology. A typical marketing discourse is characteristic of problem/solution structure that signifies imperfect body pieces with sociational problems and proposes medical cosmetology as solution to sociational problems. This paper concludes that the combination of commercial marketing strategy with medicalization in lifestyle medicine deserves more attention. Moreover, perfect/false body image might be constructed in opposition to imperfect body pieces along with standardized beauty.

"The Republic of Plastic Surgery" Built on the Newspapers in Korea, 1960-2009. *So Yeon Leem, Seoul National University*

Korea has a huge reputation for its popularity of plastic surgery. A Plastic Surgery Network in Korea as other bio/medical technology networks has been formed and developed with/by various groups of actors including mass media. In this paper I look at two of major newspapers - The Chosun Ilbo and The Dong-a Ilbo - in Korea and trace how plastic surgery has been represented in those media since 1960's. Here newspapers are seen as construction sites where Korea as "the Republic of Plastic Surgery," "Plastic Surgery Powerhouse," or "the Kingdom of Plastic Surgery" has been built. It has passed through five phases as followings. First, plastic surgery was publicly known for its aesthetic purposes. Second, the legitimization of plastic surgery had been undergone both legally and socially since the middle of 1970's. Third, it is during 1980's and the first half of 1990's when plastic surgery was to be established as an independent medical sub-disciplines. Fourth, from the middle of 1990's to the beginning of 2000's, it became the fact that Koreans in general like to have plastic surgery and plastic surgery clinics as leading parts of beauty industries in Korea gained stable social, economic, and cultural status. Fifth, since the middle of 2000's, the field of plastic surgery has been considered to secure national competitiveness in the world market and now is targeting at foreign patients. The elaboration of each phase also shows that to build "the Republic of Plastic Surgery" has involved various actors such as surgeons, women, young generation, middle-agers, foreigners, feminists, critics, and so on. After all, what I have found from newspapers is not just media representation of plastic surgery but that of its network construction.

Chair:

John Paul DiMoia, National University of Singapore

Discussant:

John Paul DiMoia, National University of Singapore

085. Public Engagement at a Global Level - Deliberating Climate Change

3:00 to 4:30 pm

5: 533

On September 26, 2009, ordinary citizens convened at 43 sites in 38 countries to discuss the issues that would be on the agenda at the December 2009 UN climate summit in Copenhagen (COP 15). Armed with 40-page briefing reports they had received before the event and seated at tables of 6 - 8 (approximately 100 people total at each site), participants debated and voted on a common set of policy choices and developed their own recommendations in the first global citizen consultation in history. In the words of the project organizer, the Danish Board of Technology, World Wide Views on Global Warming (WWViews) aimed " to give a broad sample of citizens from across the Earth the opportunity to influence global climate policy. An overarching purpose was to set a groundbreaking precedent by demonstrating that political decision-making processes on a global scale benefit when everyday people participate." For STS researchers, WWViews was an ideal natural experiment for inquiries in public engagement, science policy, the global environment, action research, and other themes familiar to the 4S community. The presenters on this panel all attended WWViews deliberations on September 26, and some organized them and helped convey the results to the media and decision-makers. Among the questions addressed by the panelists are: 1.How can/should scientific knowledge be framed in a very political arena like climate change? 2.How well does a single deliberative method travel across cultures and national boundaries? 3.Can policy-makers listen? Will they? 4.What role can STS researchers play?

Participants:

Deliberating Climate Changes - the Creation of a Voice for Citizens? *Annika Agger, Roskilde University*; *Birgit Jaeger, Roskilde University*; *Erling Jelsoe, Roskilde University*; *Louise Philips, Roskilde University*

The global event World Wide Views on Global Warming (WWViews), initiated by the Danish Board of Technology (DBT), took place on September 26, 2009, and was an innovative attempt to gather a united citizen voice on a global scale. As such the WWViews is one of the most recent experiments with new ways to include the voice of the citizens into complex scientific and technological issues. The purpose of WWViews was to pass on the opinions of ordinary citizens to political decision-makers at The United Nations Climate Summit, COP15, in Copenhagen in December 2009. The authors made a study of the Danish WWViews event including a) observations on the Danish location, b) survey among the participants, c) follow-up focus group interview with voluntary participants, and d) interview with the organizers of the global event from DBT. Based on this study we analyse how the deliberation was institutionally framed. This includes considerations regarding how the process was designed in order to be legitimate as a voice for citizens, how different types of knowledge and expert identities were created and negotiated in the event, and how the framing influenced the outcome. The specific conditions of the event, i.e. the relation to a high-policy global summit like COP15, are also considered in the discussion about the WWViews as innovative design. The analysis draws upon theoretical perspectives of deliberative democracy and STS studies of public engagement with science.

Finding Lubricants to Policy Transfer: Can Global Deliberation Be Rooted in a National Policy Arena? *Mikko Rask, National Consumer Research Council*; *Maarit Laihonen, Helsinki University*

World Wide Views (WWViews) is a new concept for deliberative democracy and climate policy. It was introduced and adopted in various countries and policy cultures beyond its original context, Denmark, before the UN Climate Change Conference in Copenhagen in December 2009 (COP15). Even though some aspects of cultural variation were taken into account through the partners of the WWViews Alliance, who contributed to the concept design, it is still relevant to ask whether the assumptions of WWViews concerning citizen participation in policymaking move on well. This article aims to explore early experiences of impacting and transferring the WWViews model by building a theoretical framework on policy transfer of deliberation and applying it to an analysis of the Finnish WWVIews and its adaptation in the national policy arena. Our framework is build on literature on policy transfer (Sabatier 1988; Heiskanen 2009) and it focuses on three main factors explaining policy transfer: the receiving institutional context; the carriers of the models; the role of "translation as an active process". While the policy transfer framework provides a general heuristic model for studying the process of policy transfer and impact, we complete it with Renn's (2008) specific typology of different concepts of deliberative democracy. We argue that the WWViews concept has characteristics of an "anthropological" concept of deliberation (in Renn's typology) and that there is a great potential to "hybridizing" it with other versions of deliberation. Finally, we propose a set of strategic options that can help design future WWViews and deliberative citizen consultations in a way that is more easily adopted in its local policy context and helps intensify its impact in the established policy context.

Cultures, contexts and climate change: a wicked problem in international public participation and multi-level governance. *Edna F. Einsiedel, University of Calgary*

Increasing interest in and attention to various forms of public engagement in the last two decades have contributed toward the characterization of governance as the proliferation of distributed nodes of engagement and decision-making. Such processes have involved "a form of social co-ordination based on 'dialogic rationality', where goals are 'modified in and through ongoing negotiation and reflection' (Jessop, 2000). In the case of global issues like climate change, the implication of different levels of institutions - international, national and local - make the question of who participates and how in these processes of negotiation and reflection even more challenging. Experiments in different participatory forms have been primarily national or local, with two citizen engagement processes across a number of European countries offering a multi-national (though one region) exception. The challenges encountered in a global public engagement process on the policy questions that faced international decision-makers at COP15 with citizens from 38 countries offered a different set of challenges. In multi-level governance, participation of citizens from different cultural contexts and differing national interests and priorities poses challenges on three levels: how to account for cultural particularities around public participation, how to accommodate different national contexts and priorities on climate change, and how global and local citizenship roles are enacted in the context of the challenges of climate change as global governance problem. More recent work on public participation has located such initiatives centrally within their social-political contexts. At the level of citizenship, relevant literatures have also built on citizen identities as being bound up with social relations of place and other social identity categories. Climate change, on the other hand, potentially raises different identity formations, that of "communities of fate". These juxtapositions raise challenges which we present by describing the Canadian and comparative experiences of ten other partner countries in the Worldwide Views endeavor (gleaned through in-depth interviews with their project managers). We argue that the institutional conditions for carrying out this multi-national, multi-sited public participation reveal the tensions inherent in such a process: the tensions around different forms of citizenship, the consequential demands of the climate change problematic, and the procedural conditions for participation within varying cultural contexts. These tensions need to be more fully explored. That said, we nevertheless conclude that it is only through such social experiments that the challenges and democratic potential of multi-level governance can both be better understood and realized.

Chairs:

Birgit Jaeger, Roskilde University
Rick Worthington, Pomona College

Discussants:

Alan Irwin, Copenhagen Business School
Ravtosh Bal, Georgia Institute of Technology

086. Mental Disorders, Medicine, and Personhood

4:45 to 6:15 pm
12: 1212

Participants:

"The (Un)managed Self: Self-Management of Bipolar Disorder and the Dilemma of the Choosing Subject." *Talia Weiner, University of Chicago*

Self-management of mental illness is a widely accepted therapeutic paradigm in the contemporary U.S. The very idea of self-management draws on a distinctly biomedical conceptualization of the isolability of personhood from pathology. Drawing on analogies to the diabetic's practice of monitoring his own insulin levels, this discourse of self-management in mental health therapies posits a stable and rational patient/consumer who can observe, anticipate, and preside over his disease through a set of learned practices. But in the case of bipolar disorder, where the rationality of the patient is called into question, the kind of self that is able to engage in self-management is often elusive, and the disease that is managed looks a lot like the self. Humanist anthropological critiques of the biomedical model as applied to mental illness have argued that its logic dangerously precludes genuine patient responsibility and fatalistically denies of them "[full] moral personhood" including intentionality and

effectiveness (Luhrmann, 2000). However, biomedical proponents not only believe that a failure to separate person from disease amounts to cruelty and misplaced blame, but also claim that biomedical psychiatry's way of envisioning the body as separably under the control of the intentional mind actually returns agency to the patient/consumer. In his analyses of the psychiatric gaze and its related technologies for intervention upon madness, Nikolas Rose remarks that biomedical models have the potential to "[open] that which was considered natural to a form of choice" and that techniques of medical self-control work together with, and appear to constitute, the free embodied subject of liberal democracies who is obliged to calculate and choose (Rose, 1999 & 1996). The myth of choice, when it is exercised in relation to embodied conditions, has the consequence of dividing the subject into several forms of agency, at least. In light of these perspectives, this paper takes up the question of how, as a "technology of the self," self-management is practiced (or not) and experienced by people diagnosed with bipolar disorder. Through an examination of expert clinical literature as well as the discursive practices and narratives of members of DBSA (a depression and bipolar support group), I argue that "self-management" here—where 'self' refers to both the manager and the object to be managed—foregrounds broader dilemmas contained within psychological discourses of the choosing subject. Support group members must, paradoxically, express their expertise as rational self-managers by articulating a constant suspicion toward their own present thoughts and emotions. Further, DBSA members experience a temporal discontinuity with, and distrust of, an imagined future self; in a way, they cannot fully trust the medical prognosis given as part of their self-managing therapy. I argue that the ways in which bipolar people take up and complicate the biomedical paradigm in their self-management practices offers valuable insight into the contemporary medicalization and reification of selfhood.

"Civil War," a "Crusade," and "8 New Ways You Might Be Insane": Revising the DSM. *Harald Kliems, Cornell University*

The Diagnostic and Statistical Manual of Mental Disorders (DSM), edited and published by the American Psychiatric Association (APA), is arguably the most important classification system for psychiatric disorders. It defines the boundary between the normal and the pathological; and this boundary then comes to not only structure psychiatry as science and practice but it also shapes individual and cultural perceptions of what it means to be mentally ill. Central to the rhetoric of the DSM is the claim that it is an entirely objective system, with the APA ensuring that DSM-V will be based on the best and latest scientific research, and to eliminate conflicts of interest in its development." However, as Bowker and Star and others have shown, classification systems are culturally and historically contingent and the result of complex negotiations of various actors. One important characteristic of successful classification systems is that they become invisible once they have been instituted. For the DSM, a moment of becoming visible again has arrived with the preparations for its fifth edition, scheduled for publication in 2012. Controversy about the DSM has never completely disappeared and during the revision process many of its critics, both within and outside of the psychiatric community, have become more vocal again, providing the opportunity for a sociological analysis of the processes and negotiations involved in re-creating the DSM. Based on published materials and interviews with APA officials and critics, I will provide an analysis of the fault lines between proponents of the new DSM, its critics, and the psychiatric profession at large. The major points of contention are potential conflicts of interest of DSM work group members; the perceived lack of transparency and scientific rigor of the revision process; and the announced "paradigm shift" of DSM-V, moving away from a descriptive, categorical approach to a dimensional way of classifying mental disorders. My analysis will provide a better understanding of the politics of claims—and counter-claims—of transparency and objectivity in the creation of a large-scale classification system. In addition, my paper will shed further light on how the problem of delineating and redefining pathology and normality in psychiatry is being resolved on the formalized level of a classification system.

087. Waste and Recycling

4:45 to 6:15 pm
12: 1213

Participants:

Not just for experts, not just risks, not just technical matters: insights from the conflict over hazardous waste in Portugal. *Helena Jeronimo, ISEG-UTL & SOCIUS*

Few environmental issues have been more contentious than the building of infrastructure for treating or disposing of waste, especially hazardous waste. In Portugal, the political decision to implement co-incineration (a method of burning hazardous industrial waste in cement plants) has turned out to be one of the most significant, most debated, most participated and most long drawn out political and environmental conflicts of the last two decades. Using evidence from this conflict, based on documentary analysis and in-depth interviews with key actors, the aim of this paper is threefold: (1) to discuss the implications of the fact that the expertise was convened after the government had committed itself to the decision to implement co-incineration and by way of a reaction to the atmosphere of tension and protest on the part of local residents, scientists and environmental and civic associations; (2) to discuss the consequences of the scientific committee's technical profile, its disciplinary origins and the binding nature of its mandate; (3) to identify the uses of the notions of "risk" and "uncertainties" in scientific reports from both experts and counter-experts' committees, and their different assumptions about controllability and criteria to consider certain practices as sufficiently safe for the public. The Portuguese case is offered as an empirical example of the need to not disregard political, psychological, social and ethical aspects, as well as different types of uncertainty, in the decisions over the location of hazardous facilities.

Number 7 Plastic: Recycling, classification and the politics of material others. *Kim De Wolff, UCSD*

Current solutions to environmental problems commonly depend on controlling flows of materials: aluminum, paper, plastics, but also less visible carbon compounds and rogue chemicals. These categories, however, do not always map easily onto the meanings and experiences of objects in everyday life. This paper works towards an understanding of how and when consumers recognize recyclable materials in consumer goods, investigating such material-object relations through the history of the seven category plastic resin code - the numbered 'chasing arrow' triangles moulded onto the bottom on common plastic packaging. Where numbers 1-6 refer to particular types of plastics, number 7 is the residual category or material 'other' that gathers potentially toxic polycarbonate along with compostable bioplastics and mixed materials. Drawing together science studies understandings of classification and materiality, I focus on the culture and politics of seeing and sorting exemplified by plastic number 7: When and how, for and by whom are such seemingly transparent materials made visible? What role does classification play in not only managing but constituting materials, objects and people? Part of a much longer trajectory of industry attempts to shape recycling practices, the plastic resin code was developed by the American Society for the Plastics Industry 'for' consumers and recyclers in the 1980s. Complicated by forms of legibility entangled in market value and codified in state legislation, this system has managed to endure intact despite many limitations, controversies and attempts at amendment. The current code fails consumers attempting to distinguish polycarbonate and bioplastics from "other" materials, or by simply lacking relevance for consumers who might lump 1-7 along with all kinds of things under the rubric of 'plastic.' Those involved in collecting and reprocessing are frustrated by arrow-triangles suggesting 'recyclability' regardless of the availability of

processing facilities, while misplaced bioplastics are notorious for gumming up equipment. In response, cities commonly supplement the code with specific lists of consumer goods accepted in blue boxes, reporters covering polycarbonate risks provide descriptions of "hard, clear plastic," and recyclers often rely on measurements of material shape and density. As materials circulate, these translations are far from seamless and intertwining trajectories of industries and corporations, consumers and governments, materials and objects create problems that are by no means evenly distributed. The involvement of the plastics and beverage industries in shaping recycling codes and legislation through market legibility and the embodied practices of consumption and disposal, however, preclude the reduction of tangled material-object relations to a problem of information or communication narrowly defined - to knowledge deficits or the 'accuracy' of classification systems. The work of seeing and sorting multiplies the identities of plastics and competing taxonomies emerge between materials and things. Attempts to standardize processes for recognizing plastics involve a kind of ontological politics, of privileging one way of seeing and doing plastic at the expense of others.

Public Engaging in 'Science' and 'Knowledge': A case of Waste Incineration Power Plant in Pan Yu. *Xiao Tan, Sun Yat-Sen University*

In GuangZhou, in China, the most popular way of waste disposal are landfill and incineration. As waste of city gets more and more, there is not enough land for landfill, so many cities turned to incineration projects in this decade. In September, 2009, many media of China reported a waste incineration power plant would be built in PanYu District to avoid GuangZhou city encompassed by waste, which can generate electricity while incinerating waste. Government propagated it as a new productive technology and it had been used widely in developed countries. But local residents opposed the project strongly; they oppugned the project would give birth to poison gas like Dioxins which effects cancer and harms health. Thus a movement began, involving local residents, government, scientists of environment, biology and medicine. First, the debating point was location and procedure of the project, which was planned to be built in the middle of many populous communities. Soon, it became to the best way of waste disposal. Local residents opposed incineration power plant to be built anywhere, not only in Pan Yu, their home, because it was an old harmful technology and had been eliminated by many countries. They invited some scientists who supported their idea to speak to media and did a lot of researches themselves to argue it. There are two results of the movement until now, one is government decided to stop the project and did a series of services for advocating waste sorting, the other is that public in GuangZhou, even in China, not only the local residents, got well known of various way of disposing waste and had a conscious responsibility for environment and their own life. It was an unexpected but good chance for public to be close to science, their engaging showed another side of science. In this case, public engaged in both 'science' and 'knowledge'. This movement was like 'Consensus Conference' in Danmark and many other countries. It showed that public engaging not only benefited government's decision making of scientific issues, but inspired them to care about science and understand it in a profound sense. Beyond this, the case also told us that public played a role in knowledge, core of science, where they are regarded to be not qualified to step in. In prospect of rhetoric of science, fusion of horizons will produce new knowledge, more than or different with sum of each own. This paper will study how public play their role, what kind of role, and what science is.

088. Colonial and Postcolonial Science and Technology

4:45 to 6:15 pm
12: 1214

Participants:

Negotiating Technology: The IITs in India. *SABIL FRANCIS, University of Leipzig*

Why could India position itself at the cutting edge of a technologically meditated service industry, thus adopting the historically unprecedented trajectory of development via a revolution in the services sector rather than in manufacturing (Dossani, 2007),as economic globalization picked up in the 90s? I argue that part of the answer lies in public policy decisions by post colonial India, notably through the the setting up of the five (now 15) Indian Institutes of Technology (IITs) the elite technical universities of India, with international assistance, in the 1950s. Using these as a methodological tool, I look at how certain modes of technology were accepted and others rejected in independent India. A clear line can be drawn between colonial decisions taken to adopt certain forms of technology and definitions of development, the institutionalization of these in independent India, and India's contemporary success in a technologically mediated service industry. While China could adapt a labor intensive mode of modernization, in India, colonial and post colonial development projects included the creation of a knowledge society. Adapting the idea that knowledge is inherently transgressive and trans-disciplinary (Nowotny, 2003), and in contrast to a top down linear diffusion model of technological transfer, my paper explores this process as a critical arena of transnational and local negotiation that was a crucial element in the legitimizing strategies of non-state governance in the post colonial state. Extant literature looks at perceptions of science in the British Empire, its institutionalization for political purposes, the impact this had on the periphery and the metropolis (Baber, 1996; Adas, 1989); the close link between Empire and scientific pursuits (Headrick, 1981); and how India's development agenda was rooted in a specific conception of development and modernity (Agrawal, 2003). Conceptions of 1930s New Deal water projects influenced Nehru's commitment to large dam projects (Klingensmith, 2007), imperial ideas of health played a role in broader debates about the post colonial order (Amrith, 2006), and Phalke (2006) has looked at nuclear physics education and research facilities in post colonial India focusing on the continuing link between colonial policy and notions of development in the independent India. However, the development decision to invest in a technologically intensive knowledge society, and its broader implications remains unexplored. I look at how this process was institutionalized and the process of negotiation with indigenous alternatives such as the Gandhian mode of development, and with those of the broader knowledge society, such as the German, British, and US models of the ideal university, that this entailed, and how this process illustrates the relevance of local contexts to the transnational circulation of technologies. Today, many of the entrepreneurs in India's Silicon Valley, Bangalore, are IIT alumni who have returned from the USA but leverage India's niche in the global knowledge society. For my sources I use science and technology policy documents that span the colonial and post colonial period and the archives of the IITs, from my fieldwork in India, and locate them in the broader context of literature on technologically mediated modernization.

Colonial Technologies and the Science of time: India in the mid-nineteenth century. *Geeta Patel, University of Virginia*

Colonial Technologies and the Science of time: India in the mid-nineteenth centuryColonial Technologies and the Science of time: India in the mid-nineteenth century Discussions of science and emerging technologies and of colonial state policy have had a fairly long and illustrious lineage in South Asian Studies. Five series of events occurred simultaneously in India in the mid-nineteenth century between 1840 and 1860: the growth of technologies of communication, trade and travel such as the railways and the telegraph, colonial state policy regarding technologies and their utility in the nineteenth century, science education in the mid-late nineteenth century, what kind of science, Islamic or European, ought to be used for emergent technologies and finally discussions around what science was or theoretical questions that technologies like the railway and telegraph which traversed time zones threw up about science. These five events were punctuated by a massive uprising against

the colonial state in 1857. Peter Galison's research on Poincaré' and Einstein places the European discussions on the railways, time and mapping in the late nineteenth century. But if one looks at India, the demands around codifying time zones occurred in the 1840s, precisely because technologies like the railways required traveling across time zones. The engineers involved with the railways and the telegraph were conducting discussions in the 1840s about whether time could expand and contract and whether clocks ought to be synchronized, what science education might call for and what kind of science they should use. These negotiations on the question of time, technology and science came to be inflected by 1857. In this paper I would like to bring together all of the five series I mention to look at how all of them might inflect or change one another if they are considered together and what 1857 might mean for all of them considered in tandem. What kind of science did emergent technologies produce? How was this science inflected by the use of technologies by the state to suppress anti-colonial resistance? How did the violence or ruptures of 1857 transform the scientific questions on time that came to inhabit center stage in the period following the upheaval? What were the implications for education and state policy? What were the implications of these mid-nineteenth century transformations for science and technology in the post-colonial Indian state?

Laboratory studies in China: mapping the history of modern science in contemporary China. *Christine Luk, Arizona State University*

The history of modern science in China is a relatively unexplored territory for most historians of Chinese science. Preeminent scholarly efforts have been devoted to understanding the achievement of science and technology in premodern China partly as a collective response to the "Needham Question"--why did the "Scientific Revolution" take place in Europe and not in China? The ramifications and limitations of the "Needham Question" were examined, too.2 Recently more historians of science and technology in East Asia began to turn to modern science--science in the twentieth century--to look at the role of expert knowledge in enforcing the state authority and the intertwining of the discourses of scientific rationality and socialist modernization; 3 the transnational character of the development of the scientific community and enterprise in the post-Mao era; 4 the cultural encounter between colonial naturalists and their local counterparts5 etc. Along with this tide of efforts, this paper proposes that laboratory studies could be a useful channel to tell revealing stories of the practice of science in contemporary China. By paying close attention to the mechanical configurations, scholars exploring the enactment of human-objectual relations show promise of generating data and studies that will enable us to make a more solid comparison between the development of modern science in the West and China. In this paper, I assert the theoretical significance of studying laboratory practices and cultures in China by first reviewing the conceptual contributions of laboratory studies in the literature of Science and Technology Studies (STS), followed by reviewing the avenues of inquiries to study modern science in contemporary China. I juxtaposed the two traditions--STS and Chinese studies--through the comparative lens of the science-state relations. I present background figures about the recent scientific growth in China and the response from the United States. After discussing the significance of studying China in general and science in China in particular, I articulate the importance of studying laboratory practices and cultures in China by delineating the intellectual strengths of laboratory studies in the STS landscape; followed by avenues of inquiries to study modern science in contemporary China in the Chinese Studies topography. To lend support to the argument that laboratory studies is a useful analytic tool to map science-state relations in twenty-first century China, I give a historical tour of the evolution of the science-state coupling at three critical periods: 1) May Fourth Movement in 1919; 2) during the Maoist regime from 1949 to 1976; and 3) in post-Mao's era after 1976. In short, the paper seeks to explore the contributions of conducting laboratory studies to mapping the history of modern science in contemporary China.

089. Traveling Comparisons 3: Different Natures in the Making: Multinaturalism in Contemporary Science and Technology

4:45 to 6:15 pm
12: 1222

This third session presents papers that explore differences in natures. The starting point for these reflections is research in STS and social anthropology, which has provided support for the idea that it is not only societies and cultures that vary, but nature as well. Pluralizing nature - as natures - enable researchers to investigate how specific natures emerge through processes that involve multiple actors, some assumed to be social, some natural, some taken as material, others to reside in the realm of ideas. Although the concept of a unified and coherent nature is basic to a rationalist scientific attitude, it is clear from such studies that nature is not given, but rather co-produced. It is far from certain that global society (as exemplified by the recent COP 15 UN climate conference) serves to identify common concerns over one natural world. It seems rather the case that contemporary science and technology operates in a situation where many, sometimes competing, sometimes co-existing, but invariably contrasting natures abound. The papers in this session aim to elucidate the theoretical and empirical consequences of studying scientific and technological activities as engaged in making multiple, divergent natures. Contrary to what might be seen as implied in notions of the production of nature, the papers in this session do not assume that making natures is a matter of human volition. Always, multiple human and non-human actants are at play, intensely interesting the scientists, technologists and policy-makers involved with them, yet always likely to resist or redefine efforts to easily categorize (or, indeed, naturalize) them. By following empirical instances such as efforts to build robots, create climate models, ensure the safety of buildings in earthquake prone areas, or find ways of having herbal medicines enter into bio-medicine, papers in this session become obliged to eschew 'natural' categorizations such as the scientific and the spiritual, the real and the virtual, the material and the ideal, the rational and the primitive. Tracing specific instances of how such irreducibly different processes create diverging socionatures, the papers show that both epistemological and ontological differences in nature are at play when moving between sites, countries and disciplines. If the session demonstrates how STS increasingly finds itself in situations of multinaturalism rather than multiculturalism, this raises important questions that can be captured under the heading of traveling comparisons. Such questions include (but are not limited to): How are socionatures composed and what make them different? How do specific socionatures create and maintain boundaries to an outside, or how do (some) try to expand their territory by breaking down boundaries? What are the limits and possibilities of knowledge making from within a socionatural regime? Perhaps most important is the broadly political question of what will allow radically different socionatures to interact and negotiate their differences in ways that are not premised on the asymmetrical assumption that we inhabit one nature, which all sensible people will know how to recognize?

Participants:

Between Earth-quakes and Fake-Quakes. *Shuhei Kimura, CSEAS, Kyoto University*

This presentation describes three cases related with earthquakes. On August 19th, 1999, two days after a great earthquake hit northwestern Turkey, a famous seismologist warned on TV that a big earthquake might hit Istanbul in a couple of days and that people should stay outside during the night. Since he was the director of the Seismological Observatory in Istanbul, he could access to the very process of seismological knowledge production. He claimed that he was sure that he observed something abnormal, but after all, no earthquake happened. Even so, it is not easy to say that his warning didn't have scientific accuracy. According to the seismologists working there, noises slip into the data easily because of the heterogeneity of the observation system in Turkey. Thus, to sort noises out, they compare data recorded by the seismographs with the "right" images of data they have acquired through practice. In other words, seismological analysis always faces risk of misjudgment.

In 2006, the demolition of a condominium launched in Kanagawa, Japan. The reason was that the architect forged structural calculation data of buildings including the condominium. His fabrication came to light after the data passed the screening and people moved into them. "Real" calculation of them fell much below the code: they were expected to be destroyed by a moderate-sized earthquake. Residents didn't want to keep living in the condominium and decided to demolish it, saying an earthquake could hit at any moment. What is the problem here? A critic made a comparison between this "scandal" relating to earthquakes, and other mundane events in Japan. Specifically, he compared the earthquake scandal with the endless scrap-and-build processes that are advancing in Japan and called these latter for "silent earthquakes". According to him, the problem is not earthquake but "silent earthquakes". His point was that while earthquakes may destroy buildings violently but occasionally, "silent earthquakes" destroy buildings all the time. On February 21st 2007 at midnight, people in a certain district of Istanbul felt an earthquake and got out from their houses. It was a self-collapse of an apartment: the earthquake people felt was not what made the building fall over, but was caused by the building falling over. While the authorities declared the cause of the collapse to be the low quality of the building, local people assumed it to be the damage from the earthquake that happened 8 years ago. In each case, we see local practices to produce knowledge, through comparing what they see with the images about what earthquakes are supposed to be like. Through comparing them, I will examine the process of scientific knowledge production.

Integrated Localities, Fragmented Worlds and Climate Models.
Antonia Caitlin Walford, IT University of Copenhagen

The co-production of - or mutually constitutive relation between - science and society has been a particularly comprehensive and convincing perspective afforded by Science and Technology Studies (STS), especially in the social study of climate change science and environmental governance - two topics that have become almost synonymous in some contexts. In climate modeling, spatial and temporal holism has guided research, as can be seen by the production of "General Circulation Models" - or Global Circulation Models -(GCMs) based on "global data sets" including data afforded by satellite imaging of almost the entire earth with the aim of predicting world-wide climatic trends many years into the future. Likewise, during the COP15 UNFCCC climate change conference held in Copenhagen in 2009, much was made of climate change being a "global problem", requiring a world-wide response uniting the cultures of the world. Both of these perspectives - the one from "science", the other from "politics" - seem to speak to an image of a world that is unified, coherent, knowable and connected. One nature: one world to be scientifically mapped and modeled, one global culture uniting in the face of imminent disaster. This "global gaze" has been critically explored by several STS scholars ; however, it has not only been STS critiques that have sought to expose the uncertainty contained within such an idea. Indeed, it could be said that the "globalness" of Global Climate Models is one of the most contested notions within climate science's own back yard; and the controversy surrounding the COP15 conference likewise points to the clamour of voices striving to be heard, rather than the united voice of one global culture. This paper aims to explore the way that the global gaze interacts with and even precipitates these local concerns. Rather than suggest alternative (and "relative")"local" perspectives as opposed to a global universalism, this paper aims to investigate the relation between these two. Drawing on climate modeling, it explores the inverse - that many different worlds may belong to a single locality - and examines the capacity to sum up or integrate localities to make the world or divide up or fragment the world to make localities.

Giving "Value" to Knowledge: Comparative Practices and Documents in the Bioprospecting Process under the "Herbal State" Policy of Uttarakhand, India. *Moe Nakazora, University of Tokyo*

Bioprospecting is a new name for an old practice: the scientific exploration of nature and traditional knowledge as leads for developing new drugs. Its recent revival has raised the issue of intellectual property rights for indigenous people, thus making the spheres in which various forms of knowledge (traditional medicine/science/law) intermingle. This presentation explores how the question of similarity and difference between traditional medical practices (Vaidyas' knowledge) and scientific knowledge, and further between scientific knowledge and legal frameworks (village panchayat) are considered within the contingent connections made through scientists' bioprospecting processes in Uttarakhand, India. Uttarakhand is the 27th state of India, which came into existence on November 9, 2000. It is a part of the North-Western Himalayas, and its environment is rich in important medicinal and aromatic plants, as well as related traditional medicinal wisdom. In view of this fact, the state government has taken steps to develop the new state as an "Herbal State," and is formulating various plans to achieve economic and social development through the commercialization of medicinal plants. The first task allocated to the nodal research agency of the state was to "scientifically" formalize and document the tacit and secret knowledges of traditional medical practitioners (Vaidya) in the state. The agency's second task was two-fold: it was charged with developing techniques to cultivate plants used by Vaidyas, as well as the crude drugs based on Vaidyas' knowledge. In order to make benefits-sharing efforts possible after the successful cultivation and marketing of these plants, the agency also sought to certify Vaidyas' intellectual property rights through registering both the documented knowledges and their "owners" with the village panchayat (the local legal system of India). Based on anthropological fieldwork, I will examine this unique bioprospecting process of making visible (giving "value" in Strathern's sense) the "hidden possibilities" of plants and traditional knowledge through translation into scientific and legal languages. Special attention will be paid to the fact that comparison occurs at each stage of this process, including the selection of project sites, writing funding proposals and question lists, selecting a methodology, the actual interactions with Vaidyas, and participation in regular meetings of village panchayat. Also, it should be noted that these comparative practices are mediated by various forms of documents. For example, classic medical anthropological literature, important ethnobotanical works in this region, and specimens of medicinal plants collected in the colonial period are frequently used by scientists to give temporal form to "Vaidyas' knowledge." Furthermore, it should be recognized that not only the scientists, but also Vaidyas themselves refer to popularly circulated Ayurvedic books to articulate the similarities and differences between more formalized Ayurvedic knowledge and their own "pure" knowledge. By focusing on these different comparative practices, this presentation aims to claim that subjects and objects of comparison do not exist a priori, but are made only within contingent networks.

Techno-animism in Japan: Shinto cosmograms, actor-network theory, and the enabling powers of non-human agencies.
Anders Blok, Copenhagen University; *Casper Bruun Jensen, IT University of Copenhagen*

This paper considers a variety of contemporary technological and cultural Japanese practices (around toys, robots, animal research, ecology etc.) in light of the proposal from actor-network theory that nonhuman agents should be analytically activated in STS analyses. One central observation guiding this analytical interest is that Japanese culture has been regularly characterized as infused with an "animist unconsciousness", with significant inspiration from the religious beliefs and practices of Shintoism. In classical anthropological literature, animism is described as a set of irrational and pre-modern beliefs in the agency of objects, in direct opposition to the rational, naturalistic and scientific attitude said to prevail in modern societies. Japanese cultural and technological practices present a critical case with respect to this question, since Japan is one of the most modernized (perhaps

hyper- or post-modernized) countries of the world. If 'techno-animism' is a prevalent feature of contemporary Japanese life, as we will claim, this poses analytical questions relating to the category of animism (and what it means in a scientized society), and requires a re-conceptualization of relations between 'religious belief' and 'rational knowledge'. In the paper, we broach this question by considering how a Shinto sensibility (if not cosmology) continues to reassert itself in Japanese technologically mediated practices. Theoretically, it is hard not to note the congruence between Shintoist ascriptions of agency to animals, technologies and natural events and the aspiration of actor-network theory to conduct symmetrical analyses of people and things. If Latour's intervention "in the West" has been to press 'beyond naturalism', given that nature is not given but enacted out of the activities of multiple agents, then ANT can be fairly said to exhibit a techno-animist sensibility of its own; one in which the "cosmos" is gradually composed through practical ontology, as the dynamic and situated sharing of competencies among humans, technologies, animals - and even gods. Yet, in light of ANT's insistence on different compositions of networks (all networks are not the same, all are irreducibly different) we aim also to show how ANT might be diffracted through a Shinto-inspired techno-animism. Consequently not only societies but also natures inhabited in different parts of the world may be vastly different. Improving our abilities to recognize the multi-natures (from Eduardo Viveiros de Castro's multinaturalism), we argue, may provide STS with new resources for considering how to respect the 'souls' of nonhumans, perhaps thereby increasing our changes for salvaging a livable common world of humans and non-humans - the ambition designated by Latour with the term 'political ecology'.

Discussant:

Steven Brown, University of Leicester

090. Science, Technology and Society at the NSF: An Information Session

4:45 to 6:15 pm

12: 1232

Participant:

Science, Technology and Society at the NSF. *Michael E. Gorman, National Science Foundation*; *Melissa Jacquart, National Science Foundation*

tba

091. Disability and STS

4:45 to 6:15 pm

13: 1312

As the first decade of the 21st century closes, the world enjoys levels of technological and scientific development never seen before. And yet, disabled people face great difficulties in sharing the wealth of the affluent society all around the globe. Has knowledge production and technological design failed to deliver for disabled people? Or is it our science and technologies that (re)produce disabling barriers to welfare, education, labour, and infrastructures? We invite papers from all over the world and in relations to all types of science and technologies that deal in one way or another with the configuration of the built environment, assistive technologies, rehabilitation and social attitudes toward disability and accessibility to join us in Tokyo. Studies combining STS work with the field of disability studies are also welcomed. Through case studies or other qualitative methodologies, we would like to assemble a panel of scholars dealing with issues such as: 1.What is disability? 2.Disability and accessibility 3.Who is a disabled individual? 4.Is a disability technoscience possible? 5.Is universal design a myth or a technoscientific possibility? 6.How do disabled people participate in technology and infrastructure development? 7.How does the construction of a 'normal' user for different designs play for and/or against disabled people? 8.What is the relation of disability studies with other approaches also dealing with difference: gender, race, post-colonial, de-colonial studies. 9.Disability and the state. 10.How can STS and disability studies inform each other? 11.Disability and transport. 12.Disability and the labour market. 13.Disability and education. 14.Disability, social research and method.

Participants:

Destabilizing disability: the case of Athens Metro 1991-1993. *Vasilis Galis, Dr*; *Francis Lee, Linköping University*

The aim of this paper is to tell the story of the destabilization of the Greek disability movement and the construction of Athens Metro, during the period from 1991 to 1993, through the lenses of a modified model of translation, developed by proponents of ANT. Our ambition is to enrich/expand/update the model and therefore our point of departure will be the acknowledgement that the process of translation has an excluding and including character. This will enable us to diffract struggles for hegemony in the network Athen's Metro-accessibility. Thus, we argue that we need to understand every process of translation in relation to its simultaneous process of exclusion, and therefore we propose to add antonyms for problematisation, intressement, enrolment and mobilisation to ANT's sociology of translation (Callon 1986). Telling the story of Athen's Metro and disability through a vocabulary of perversion rather than problematization; estrangement, rather than intressement; rejection, rather than enrollment, and destabilization rather than mobilization, we attempt to construct chains of difference rather than chains of translation, chains of exclusion rather than chains of power. In doing this we wish to contribute to yet another take, on the long-lasting debate on power, powerlessness, machiavellianism, and managerialism within actor-network theory and ontological politics. To show the importance of this shift toward a sociology of destabilization we will use our empirical example to highlight how non-human actors can articulate shifts and exclusions. In the analysis of actor-networks, the process of mobilizing alliances and constructing networks is a common and worth-while focus. However the simultaneous betrayals (trahisions), dissidences, and controversies are only implied in telling of construction stories where strong networks are built. In order to nuance the construction aspect of network building, and also shine the analytical searchlight elsewhere, where the theoretical tools of ANT have not systematically ventured, we would like to propose the use of antonyms to the vocabulary of translation. Our specific case focuses on the network building around providing measures for disabled people in the construction of the Athen's Metro, during the period between 1991 and 1993. The discussion will focus on the efforts of disability organizations to intervene in the initial construction works of the metro project and the simultaneous actions of the Greek government to exclude disability organizations from the design process and to destabilize the accessibility-metro actor-network.

Accesibility, transportation, the city and STS - De-colonizing accessibility and STS. *Andrés Felipe Valderrama Pineda, Technical University of Denmark*

The urban transportation system Transmilenio began operation in Bogotá, Colombia, in 2000. For all the advances that the designers and operators of Transmilenio have conceived and implemented there are still a lot of shortcomings, especially for the accessibility of disabled people. The feeder lines towards the edges of the city do not have the accessibility advantages that the trunk lines do. As a consequence, the system discriminates: those who live close to the trunk lines have better access than those that not. "Go live close to the trunk lines!" responded aggressively the major of Bogotá, Enrique Peñalosa, when disabled associations started to complain about the lack of accessibility to the feeder lines in 2000. This paper contributes to the scholarship of STS in various ways: 1. Focusing and studying both successful and failed concerned groups that struggle to accumulate influence over the development of the built environment (Galis, 2006), especially in relation to mobility, in Bogotá. 2. Deconstructing notions of normality and abnormality (or non-normality) that still today pervade the reasoning behind certain choices (Moser, 2000). For example, the designers of Transmilenio argued that installing elevators in all the buses of the feeder lines was too expensive in relation to the possible travellers that would need them. They had the normal economic calculations on their side, whereas disabled groups where

challenging both the system and the ways of counting costs and benefits. To this end, I will bring in the most recent reflections of the de-colonial working group to unveil the colonial character of normal knowledge and technologies (Maldonado, 2007). 3. It is of course not the same to be disabled in Bogotá, than in Copenhagen, there are knowledge, cultural, institutional, infrastructural and legal differences that make the struggle different. In Colombia it is noteworthy the existence of the tutela as a legal recourse that can be employed by single persons to denounce human rights violations, like the one Mr. Bermúdez employed. However, such tools only work if the other side is mobilizable by law: Transmilenio as a truly operating agency in fact responded to the ruling of the higher courts; however, the same recourse used against the traditional collective transport system would have been useless, as there is no administrative way of making bus owners comply with many of the (often exaggerated) regulations for public transport in Colombia.

"Well, the building made the decision": the turbulent social life of a Napoleontic fortress as an accessible building. *Greg Nijs, PhD candidate*; *Ann Heylighen, Katholieke Universiteit Leuven*

In this article we discuss the case of a Napoleontic fortress that has been renovated recently. Accounting for its accessibility to disabled users, we trace the building's turbulent social life since its last big renovation in the year 2000. Having been built originally to keep enemy soldiers out—with its dry moat, its disorienting pentagonal shape that equally prevented friendly crossfire, and every other architectural aspect strategically assembled—the fort was scripted for warfare. Whereas currently, in its conversion to a cultural facility for leisure and educational activities, the fort has been—and continues to be—re-scripted to be accessible for all. However, as a building-in-becoming, it does not stand passively and affects different actors in different—and sometimes opposing—ways. Infused with actor-network theory (ANT), the article looks at how the fortress has become a controversial icon of accessibility, being showcased as an example of best practice in universal design by several actors while the architects did not have any 'special' attention for disability nor accessibility. The 'entrance ramp for all' serves as an empirical case in point. Further, following recent developments in ANT accounting architecture, we account for the building as a mediator and thus for its agency: how it resists intentions of the architects, structural engineers, heritage consultants, and city officials; how it induces architects' and others' 'subordination'; and, subsequently, how the architects negotiate with the building. Finally, we consider the Napoleontic stronghold as a moving building and how it performs disability. Non-human elements are continuously transformed or added so as to offer disabled users the opportunity to differently enact their disability, thus changing experience and the distribution of agency for them: the scripting of the circulation for wheelchair users; the introduction of audio guides as an (extr)a-visual mediator of experience; and the 'virtual' roof visit on a monitor for the less mobile to replace the—for them—inaccessible 'real' terrace experience on the roof. Following the article's plot line, we suggest that one should be on the qui vive when considering iconic enactments of buildings, that a (re)turn to the building itself and its renovation process could help, and—in addition—that this (re)turn should also comprise the actual working of the architecture, that is how it influences users' enactments of disability.

The paradox of empowerment within vocational rehabilitation trajectories. *Lineke van Hal, Maastricht University - CAPHRI - dept. of Health, Ethics and Society*; *Agnes Meershoek Meershoek, PhD*

The last decennium a wind of change is blowing through the social security systems of European countries. Regarding the policy on 'work disability', attention has been shifted from income substitution to labour participation in the Netherlands. One of its implications was that regulations concerning disability allowances have been tightened. For a large amount of people with a work disability this change signified that they had to return to work or to extend working hours after a usually long time on disability pension. To return to work can be an extensive and complex process. In order to support people with a (former) work disability in this process of return to work, vocational rehabilitation trajectories are called into being. Current approaches on vocational rehabilitation support place a lot of emphasis on the empowerment of clients. We argue that this ideal of empowerment within vocational rehabilitation trajectories is paradoxical since it is shaped by the norms of nowadays society (the active, autonomous and reflective citizen) and is mainly directed towards the (predetermined) goal of labour participation. Following this line of thought, the ideal of empowerment can take the form of a disciplining technique. In that case, empowerment is not about giving power to the client, but about supporting clients to adapt to the most powerful norms of society. But what does this mean for people who are not able to yield to those norms? Precisely because the ideal of empowerment is strongly embedded in contemporary visions on good citizenship, there is little (normative) space for vocational rehabilitation professionals to reflect on their techniques and the consequences they may have for the in- and exclusion of work disabled people. This lack of reflective space can hinder the learning processes of professionals needed to develop (alternative) rehabilitation trajectories and goals that 'fit' the variety of clients better. In this paper we want to open up possibilities for reflection by vocational rehabilitation professionals by deconstructing the ideal of empowerment. Our study is based on the narratives that 45 people with a (former) work disability told about their life and the vocational rehabilitation trajectories they participate(d) in. In our analysis we focus on people as actors of their own lives and on the different ways they relate themselves to the normative assumptions of empowerment within the practice of vocational rehabilitation.

"STS & Disability Studies: The Case of Cochlear Implantation." *Laura Mauldin, City University of New York*

Deaf infants born to hearing parents are the fastest growing demographic of cochlear implant (CI) recipients. The CI is a surgically implanted neuro-prosthetic biotechnology used to treat and, some predict, cure deafness altogether. But, there is controversy over this medical technology. Infant implantation has been the subject of fierce debates from the Deaf community, audiologists and hearing parents of deaf children. As this technology spreads, many in the Deaf community fear it can potentially eliminate the disability/difference of deafness by replacing the use of a signed/visual language with spoken language. However, parent choice for the CI occurs in a context where bioethical principles support the autonomous individual's informed choice and cultural norms celebrate the use of medical technologies. In this paper, the social and ethical implications of CIs are also contextualized within a broader discussion of enhancement technologies and critiques found in disability/Deaf studies. While CIs were developed to 'help' deaf people, the main consumer has become hearing parents of deaf children. Through ethnographic fieldwork, I outline the social matrix within which infant implantation and parent decision-making occurs. Observations were conducted inside a pediatric CI center for six months, as well as at various local and national CI parent organization events and meetings. In-depth interviews were conducted with audiologists and clinicians inside the center and with parents and professionals outside the clinic. I observed strong inter-institutional connections between clinic, parent groups, schools and CI corporations that act as "anticipatory structures". These not only guide parents in decision-making, but also expose them to a new socio-technical community, the CI community, that has its own norms. The results of my fieldwork show that 1) the clinical mechanisms framing decision-making and knowledge dissemination to parents are crucial for understanding why infant implantation is dramatically rising, 2) that implantation is merely a starting point for entry into a much larger "CI culture" that produces a unique, technology-bound

community that is highly organized and connected, and 3) that knowledge of how the social matrix that supports infant implantation is successful can shed light on how Deaf community may be altered in the future. Thus, using an STS approach to understand the social matrix supporting implantation aids in delineating how the Deaf critique of implantation is ineffective and how a new, emergent CI community figures into our social world.

Disabling States: the Case of Polio Rehabilitation, Israel 1949-1955. *Gaby Admon-Rick, Bar Ilan University*

During the years 1949-1955, as in other locations worldwide, a polio epidemic swept through Israel with approximately 6000 diagnosed cases. The Ministry of Health of the newly founded State was placed in charge of activities aimed at combatting the disease and its consequences, including widespread hospitalization, surgery and rehabilitation services, as well as public health efforts and subsequently vacination. Most of the activities and services administrated by the minsitry did not exist previously and were established specifically for this purpose emerging side by side with the medical concepts and practices of rehabilitation, physiotherapy, asistive equipment and orthopedic surgery. Can this historical story be of essence for conceptualizing disability in the Israeli society? In this paper I propose to apply STS concepts such as Co-production and Governmentality, in order to present an alternative narrative of medicalization which encompasses the mutual formation of the medical knowledge and practice, the government institutions, and the social category of disability. This approach will enable to open up the "black box" in the medical model of disability studies and consider the ways in which the materiality of technology, administrative and clinical practices and knowledge construct the social cateogrizaitons of disability, as well as formulate political institutions. Based on content analysis of several files found at the Israeli State Archives, including correspondence between the state and the various hospitalization and outpatient institutions, I claim that Polio can be seen as an organizing category. Historically, in 1949 when the ministry was formed, a wide variety of medical services run mostly by volunatary organizations were in place. Hence, the Ministry as a new government institution constitutes its realm of power around the issue of Polio. This is achived by mundane beurocratic practices such as a centralized administration and followup of specific medical services such as hospitalization and outpatient treatement. Furtheremore, I claim that being a disabeling disease, Polio depicts government institutions as posseesing the benevolent power to rehabilitate paralyzed children and return them to society as productive citizens. Applying STS to the understanding of disability can bring to light aspects of the materiality of social opression. In addition, focusing on disability allows STS insight into the ways in which specific structurings of science are coproduced together with political institutions and social groupings.

Chairs:

Vasilis Galis, Dr

Andrés Felipe Valderrama Pineda, Technical University of Denmark

092. Bioethics

4:45 to 6:15 pm

13: 1321

Participants:

Towards a sovereignty of suffering? Shifting logics of exception in the embryo research debate. *Ole Andreas Brekke, Uni Research, Stein Rokkan Centre for Social Studies, Bergen, Norway*; *Thorvald Sirnes, Centre for the study of the Sciences and the Humanities, University of Bergen, Norway*

In later decades, human biotechnology has become an important political field, not least due to pressing ethical challenges. Increasingly, politics have had to draw the dividing lines between legitimate and illegitimate practices. However, creating such dividing lines involves not just an appeal to moral principles, but, equally important, exceptions from such principles. Political solutions to concrete regulatory issues have often been to invent and define spaces of exceptionality where research procedures and techniques previously deemed unethical, become ethical. The ontological status of the human embryo or immoral status of human cloning are typical examples of principles, which may be respected and cherished, but where pockets of exception have been created through notions such as 'pre-embryo' or 'therapeutic cloning'. We explore the impact of such exceptional logics on the political meaning dimension, through a comparison of parliamentary debates on embryo research in Britain and Norway from the 1980s until today. In the 1980s parliamentary debates in Britain, the 'pre-embryo'-concept constituted the first two weeks of embryonic development as a normatively empty space, a zone of exception cut off from any inherent normative value. This construction of an exceptional space had a profound impact upon the 1991 decision to allow embryo research, and upon later issues, such as cloning, ES-cell research and the creation of human-animal chimeras. The notion of the pre-embryo was never introduced into the political debates in Norway in the 1980s and 1990s. The combination of religiously grounded opposition and a critique of instrumentalisation created a stable majority against embryo research (including ES-cell research), and a restrictive legislation on human biotechnology in general. In 2004, however, this stable configuration ruptured, due in large part to a media-staged event where one boy's sufferings triggered a total reconfiguration of the political landscape. The so-called Mehmet-case effectively established a new demarcation line in Norwegian biopolitics. The former, rather long-lasting main opposition had been between technology optimists and sceptics - the last fraction including both radicals and conservatives, religious and secular. The new dominant division, however, was simply between Christian and secular. Developments in these two countries highlight important trajectories concerning both how emotive discourse of hope and suffering have become important meaning dimensions in regulatory politics, and changes in how the exceptional logic following from them are expressed in political debates and regulatory decisions. In the first instance, the exception was created through differentiation, by separating the pre-embryo from the human realm. Thus the humanity of the embryo beyond the primitive streak was also underlined, with the exception mirroring and confirming the rule. In the second instance, the exception was created through breeching with differentiation. In the first instance it was still both possible and necessary to operate with principled limits, in the other the very orientation towards principles became an impossible position, thus undermining the very distinction between rule and exception. This indicates an evolving shift in the nature of the exceptional logic. In the final part of the paper, we discuss some possible implications of such a shift

The "Actor Analysis" of "Bioethics in Action": Assisted Reproductive Technology Debates in Japan. *Akashi Tanaka, The University of Tokyo*; *tetsuro Tanojiri, University of Tokyo*; *Ryuki Hanaoka, Faculty of child study, Kamakura Women's University.*; *Yoshiyuki Hirono, The University of Tokyo*

Recently, "meta-bioethics" research which questions the nature and the meaning of bioethics expands in the field of bioethics. This paper follows the trend, and the purpose of our research is to consider "bioethics in action" through the debates over assisted reproductive technology in Japanese administrative councils. Although there are various views about the nature of bioethics, it is generally categorized into the two models; (1) applied ethics model in which the role of bioethics is to apply ethical principles such as autonomy, justice into ethical problems concerning life sciences, (2) multidisciplinary model in which bioethics is the activity to use methodologies from many disciplines to solve ethical problems concerning life sciences. However, considering the case of the debates over assisted reproductive technology in Japan, we propose a new model to describe bioethics. In

this paper, we employ the actor analysis developed in the field of Studies of Science, Technology and Society. The feature of the actor analysis is found in the principle of "ontological symmetry". Using this method, we can map the relationship between science and society taking account of non-human entities such as medical technologies, law and the view of body as well as human entities such as doctors, lawyers and ethicists. Indeed, non-human actors, for example, the technologies of embryo and gamete cryopreservation, special adoption system, or the Japanese notion of family play very important roles during the discussions of assisted reproductive technology in Japanese administrative councils. Among several debates over assisted reproductive technology in Japan, one of the most complicated concerns the ethical acceptability of embryo donation. Though a lot of actors such as public administrative agency, infertility counseling and the biological relationship between parents and children appear, the process of the debate over embryo donation can be considered as the opposition of two actor-networks. The first network is based on the concept "non-maleficence to third parties" and the second network is based on the concept of "child welfare". The discussion among the members of the administrative councils is characterized not as the application of ethical principles or the ideal balance of methods from various disciplines but as the hybrid of human and non-human actors. Therefore, the attempt to achieve a consensus on the approbation of embryo donation among the members is considered to be a making process of the stable actor-network. Thus, introducing actor analysis into bioethics research will enable us to understand clearly the practice of bioethics.

Bioethics, incorporated: Exploring the roles of bioethics in the for-profit private sector. *Jenny Dyck Brian, Arizona State University*

There are increasing calls for more inclusive, open and transparent conversations about the role of science and technology in society. This paper focuses on one type of structure that is designed to engage challenging questions about the roles and responsibilities, and the ends and means, of science in a complex and diverse society. Specifically, the paper explores the ways in which bioethics is enacted within the for-profit private sector institutions, and the particular impacts it seeks to achieve. While much has been written about bioethics advisory committees within the federal government, very little is known about the ethics consultation practices, including bioethics committees, within industry. In this presentation I will explore what kinds of bioethics entities are being adopted in the private sector, and to what effect. Many bioethicists have argued that the bioethics-for-hire model is wrought with challenges; there remain deep concerns about the dangers of cooptation and conflicts of interest, especially since the corporate social responsibility movement is often criticized as simply a public relations ploy. With these challenges in mind, I will explore in greater depth the models adopted by some corporations, as well as some relevant insights from organizational and business ethics and the science policy literature, and evaluate possible forums for bioethical analysis in the private sector. The paper is informed by qualitative interviews with bioethicists who have worked or are currently working with bioscience companies such as SmithKline Beecham (now GlaxoSmithKline), Hoffmann-La Roche, Eli Lilly, and Advanced Cell Technology. The interviews investigated their role as ethics "experts" and consultants, their relationships with the corporate executives and scientists, the nature of the advice they gave, the perceived value of their work, and the similarities and differences between "private" sector bioethics and "public" sector bioethics. This presentation will highlight key findings from these interviews, and will explore answers to the following questions: What motivates the interactions between bioethics and industry? What kind of activities are industry and bioethics engaged in together? How do we know if, when, and in what way those activities are deemed effective? Are there particular structures that would foster a more productive relationship between bioethics and industry? Calls for more participatory governance and more open and transparent discussions about the relationship between science and ethics and human values are lacking if they exclude one of the biggest drivers of scientific and technological research and development - bioscience companies. As Rebecca Dresser (2006) notes, bioscience companies are key stakeholders in debates about advances in science and technology because they are often at the forefront of discoveries that are the target of public scrutiny and government oversight. Learning out what has been done, what is being done, and to what effect is an important step in figuring out how best to engage these difficult questions about the ethical and social implications of scientific and technological research and development.

IVF regulation and Bioethical thoughts in 1970s-80s in the United States and Japan. *Ryuki Hanaoka, Faculty of child study, Kamakura Women's University.*; *Akashi Tanaka, The University of Tokyo*; *Yoshiyuki Hirono, The University of Tokyo*

This paper is a comparative case study of the role of bioethical thoughts on the regulation of In Vitro Fertilization (IVF) in 1970s-80s both in the United States and Japan. In 1970s-80s, there were so many bioethical disputes against IVF in the United States. One of opponents against IVF insisted that IVF was unethical experimentation on possible future human beings and it was subject to absolute moral prohibition. However, of course, IVF was accomplished. Why? Were bioethical thoughts to blame for it? This general question is too complex to answer directly. Therefore, we focused on these problems in some aspects of problems. The question we have to ask here is to what degree bioethical thoughts contributed to the regulation of IVF in the United States and Japan. To answer this question, we focused on the interaction between the bioethical arguments and the regulation of IVF at three different levels: thought, institution and society. By employing methodology based on the actor-network for the analysis of a detailed case history, we explore the question. Texts of bioethicists, reports of bioethics commissions and documents of public opinion are the main sources of data for this study. We begin with analysis of the case in the United States. The points to be considered are as follows: (1) Bioethical thoughts (especially moral-philosophical). (2) Reports of Ethics Advisory Board (EAB) "Report and conclusions: Support of Research Involving Human In Vitro Fertilization and Embryo Transfer." (3) Public opinion about infertility as "social problems". (4) The interaction between bioethical thoughts and other factors (institutional and/or social). Next, we analyze the case in Japan especially focusing on (1) Reports of "Seimei to Rinri ni kansuru Kondankai" (possibly equivalent to EAB), (2) Academic guidelines (scientific-social factor), (3) Japanese "bioethical thoughts". Comparing the cases between US and Japan, common and uncommon features in the role of bioethical thoughts were examined. Based on these studies, we will discuss the implications of our findings.

093. Constructing Users in Urban Planning and Transport: identities, exclusions and power

4:45 to 6:15 pm
13: 1322

From sidewalks to subways, from busses to bicycle lanes, our urban environments increasingly constitute sociotechnical zones of mobility through which a large number of people transport on a daily basis. These growing levels of transfer do not only stand for a technical challenge for planners and policy-makers, they also generate behaviours and identities among travelers. We witness the evolution of highly complex transport infrastructures that radically construct the practice and experience of urban mobility. Currently, the role of travelers in designing transport systems is receiving widespread attention. The role and identity of "the traveler" is at the very centre of the dynamics of contemporary cities and their transportation infrastructures. This situation has been acknowledged by a series of developments in the fields of urban studies, geography, sociology, anthropology, and others related areas in which the study of urban mobility appears as is main subject. In this context, the aim of this session is to bring together STS researchers to present and discuss empirical or theoretical work about the role and engagement of travellers in transport planning, the

ways that planers and policy-makers construct travellers' identities while planning transport networks, how planners engage users/travellers in transportation planning and how transport networks generate/prescribe (mobility) behaviour. We welcome contributions covering the following and related aspects of urban transport design and development: * user-producer interactions in transport planning (or urban planning more generally) * identity/mobility formation during the design of transport systems * the performative role of expectations and hope in shaping urban mobility * the connected understandings of design inequalities and mobility (in)justice * social and cultural forms implied in designers/decision-makers blueprints * planners' constructions of various users' identities when planning transport systems. * The role of travellers as both users and co-producers of transport systems.

Participants:

Voices from the roadside: negotiating mobility and safety in transport planning. *Jane Summerton, Swedish National Road & Transport Research Institute & Linköping University*

Roads are complex sites of interaction and contestation among groups of actors with divergent concerns, engagements and politics. While transport planners and authorities strive to interpret and represent the needs and priorities of "travellers", specific groups of users might have highly differing expectations, hopes and fears with regard to how roads - as public spaces where concerns of mobility and safety are continually negotiated and contested - should be regulated. While some social science research has addressed the roles of travellers as participants or stakeholders in transport planning, little attention has been paid to the engaged voices of actors who can be conceptualized as roadside users, i.e. those members of "the public" who live and work alongside roads that have significant risks for accidents in which individual health and safety are at stake. How are the concerns and perspectives of roadside users expressed in specific conflicts over how completing priorities with regard to mobility and safety should be handled? What are the roles of transport planners and authorities in negotiating these concerns? How can the politics of these processes be understood? This paper will explore the ways in which various groups of transport users and planners construct issues of safety, security and mobility in contestations over speed limits on public roads in Sweden. In their attempts to influence the politics whereby speed limits are set, roadside users engage in specific appeal procedures as a means to express concerns with regard to road safety. When handling these appeals, transport planners and authorities - i.e. traffic engineers, representatives of public authorities, police and others - purportedly balance and negotiate political priorities with regard to mobility, regional development and safety. The results of the recent study upon which this paper is based indicate, however, that transport planners consistently gave priority to issues of mobility at the expense of roadside users' safety concerns, which raises troubling questions concerning the everyday practices, power relations and politics that inform transport planning. The paper will be informed by theoretical concepts from S&TS work on users' representations and roles, as well as work on social inclusion in transport planning.

Urban transformation in peripheral regions with the help of new transport infrastructure. *Maik Hoemke Hoemke, Faculty of Architecture (DARCH) - Institute for History and Theory of Architecture (gta)*

Increasing expansion of transport infrastructure is taking place in more and more countries. This trend, strongly encouraged by the globalization process, is reflected in ever-shorter journey times in both national and international travel. During such developments, extensive urban-planning alterations in areas that are being provided with new transport infrastructure tend to be viewed purely in terms of economic and efficiency benefits - and particularly in terms of the time saved when travelling the distance from starting-point to destination. An interesting aspect here is that the importance of time appears to be superseding the importance of space. However, there has been little research on the socio-spatial effects of new transport infrastructure systems. There is no awareness or sensibility for such changes, and as a result hardly any methods are available to investigate phenomena of this type. The present study is therefore intended to add a new level to research on the efficacy of new transport facilities - namely, the socio-spatial effects of transport infrastructure. The new Lötschberg Base Tunnel in Switzerland is to be taken as an example case for the purpose. When the 34.6-km Lötschberg Base Tunnel opened for scheduled operations in December 2007, the rural communes in the Upper Valais region acquired a strong new link with the catchment area of Berne. For example, the train journey between Visp (in Upper Valais) and Berne was shortened from 2 hours to less than 1 hour. In addition to the link with Berne, internal public transport connections in Upper Valais were also tremendously improved and extended. Interchange links were improved, connections were better organized, high-frequency timetables were introduced and services were substantially increased - transport facilities that are every bit as good as an urban railway network. The present study will establish the following points of emphasis. In an initial step, the newly created infrastructure, the expanded public transport system and the urban development will be examined in greater detail. Following these investigations, the socio-spatial effects of the transport infrastructure are to be examined. Using a wide variety of empirical methods, the intention is to show the ways in which increasing urbanization can be demonstrated, on the basis of social criteria. This will close existing gaps in the way in which the effects of new infrastructure facilities are seen. In addition, alterations in the social perception of the area due to shorter journey times when crossing the Alps will also be investigated. The technologization and creation of constantly new infrastructure facilities for crossing the Alps leads to alterations in socio-spatial conceptions here. The aim of the study is to demonstrate that research focusing merely on economic and physical effects in a given area, and ignoring the social aspects of new infrastructure, inevitably suffers a loss of quality. The special characteristic of the present study lies in the way in which it assesses infrastructure developments, in regions that were previously peripheral, on the basis of urban development phenomena and social phenomena.

Overcoming Flows: Enacting and Domesticating New Users of Public Transport - The Case of 'Metro de Santiago'. *Sebastian Ureta, Center for Technology and Society, Technical University of Berlin*

On February 10th 2007 a new public transport plan, called 'Transantiago', started in the city of Santiago, Chile. This plan had the aim of improve the use and quality of public transport in the city, but the results were exactly the opposite, transforming it in one of biggest crises in the country since the return of democracy in 1990. Among the actors involved in the development of the plan Metro de Santiago, the publicly-owned company who runs Santiago's underground railway, occupied a central place. In accordance with their estimations the challenge for Metro when Transantiago starts was significant; it would more than double their passengers from one day to the other. Based on recent research on the user of technology from an STS perspective, this paper looks to describe and analyze how the figure of these "new users of Metro" evolved from the first preparations to Transantiago until the full start of the plan in February 2007. First it will analyze how these users were enacted as "scripts" by the members of the organization in order to represent the future human beings who were supposed to use the system. The most prominent version among them was the image of this user as someone who did not have a "Metro culture", or who does not know how to behave in the Metro and can cause several problems in their functioning. For this reason, in a second stage, several technologies and standardized procedures were developed to "domesticate" this user, transforming it into a proper user of Metro. Finally, after Transantiago started, we will see how these prototypes of the user had to be re-enacted in order to deal with human beings who commonly didn't accept the roles and behaviors imposed on them by available figures of the user.

In the conclusions we will return to the theory on the user, exploring different ways to deal with the usual problems faced by technology designers in the mobilization of users from scripts to proper practice.

Lessons from Children's Traffic City. *Kim Kullman Kullman, Department of Sociology University of Helsinki*

Mobility research has stressed the marginal position of children in traffic, mostly explained by widespread ideas about the risks and vulnerabilities associated with childhood in Euro-American settings. This paper approaches the tension-laden relation between children and traffic through Children's Traffic City, a public traffic training area designed by the Traffic Planning Department and run by the Youth Department of Helsinki, Finland. Staging encounters between car drivers, pedestrians and cyclists during classes and exercises in miniature traffic, the park not only allows to explore the actual shaping of mobile children. Its pedagogical practices also open an entrypoint into current Euro-American traffic cultures and mobility systems by showing how they attempt - and often fail - to accommodate children. Although the park sensitises children to the intricacies of daily traffic, it risks reducing them to passive bystanders in relation to other forms of mobility, not least automobility with its standard technologies and hierarchical modes of engagement between bodies of varying speeds and sizes. Against this, the paper shows how the children question the built-in inequalities of traffic by experimenting with diverse embodied, mutual and playful relations among traffic participants. This opens a possibility to explore new forms of mobility and traffic planning ethics that extend agency to less standardised bodies.

Chair:

Jane Summerton, Swedish National Road & Transport Research Institute & Linköping University

094. Reflexivity in research

4:45 to 6:15 pm

13: 1331

Representations in visual research: Content in context - reflexivity in question This panel will question the production of subjectivities (Greek queer, conspiracy theorist, landscape artist, academic, young person) through theoretically guided empirical research. It will investigate the ways in which the audience sees the artwork and their potential to subvert norms in the society. Researchers for this panel will employ a methodological approach combining visual ethnography and personal insights. Their reflexivity and subjectivity will be applied through photography or video as already part of the "local visual practice" (Pink 2001:34) used by the research participants. Throughout their projects, researchers are consciously bringing about the trouble of their own positionality in the production and representation of their work. "I am aware that different parts of my identity play a significant role in this ethnography. I am the friend of Fokas who used to work in the club, I am an ex-member of the team express yourself who organized drag parties, I am a photographer, I am someone who left Greece, I am a guy from the west suburbs of the Athens, I am a researcher, I am one of them, I am queer, I am in my thirties, I am Greek, I am their mirror." (Kostantinos Panapakidis, Goldsmiths University) Is the researcher a subject among other subjects or an object among other objects? How problematic are subjective understandings that have implications for the produced knowledge? How viable are the products of ethnographic researchers in terms of identity anonymity, documentation worth and appropriation for presentation purposes? "As an artist, I don't question my ability to make and present what I deem is a 'worthy' photodocumentation. However, amongst straightforward sociologist researchers, there was debate on inadequacy of their digital documentation to convey the content in context." (Krisanne Baker, ecological artist) "Conspiracy Theories" are reflexive knowledge generated in what Ulrich Beck calls 'sub politics' by a lack of trust in 'the official story' and the ability of key institutions to tell the truth about risk. Reflexivity for Beck is a "self-confrontation" with the foundations of modernity (instrumental rationality). What is Reflexive Modernization in 9/11 conspiracy theories distributed via the Internet? Content within the context? (David Rose, Goldsmiths University) Situatedness is the theme in Sireita Mullings (Goldsmiths University) practice where application of the visual is paramount in rendering creative encounters with youth. Her projects permit them to negotiate and articulate their own social constructs through a creative consciousness. She believes that reflexivity strengthens the creative engagement with young people who deploy photographic ways of exploring and understanding their own lives. "Reflexivity plays a dual role for both participant and practitioner as it is through this process the works of the artist researcher is generated as document of the relationship between the participant, art medium and its impact on the artist as practitioner and researcher." How interdependent is then the research on the researched and does visual research provides participants, artists, practitioners and researchers new ways of representing varying social truths?

Participants:

Reflexivity in investigations of conspiracy theory. *David Rose, Goldsmiths University*

This project is informed by a personal (and collective) awareness of the existential and rapidly accelerating crisis in human history, experienced through such phenomena as: global warming, peak oil, the 'credit crunch' and the collapse of American Empire. This period has been termed 'The Long Emergency' (Kunstler) or 'Living on the Volcano of Civilization' (Beck). These phenomena are interrelated and point to the imminent collapse of industrial civilization itself. 9/11 marked a new and dangerous phase in the unfolding crisis of industrialised (oil dependent) civilization. I will seek to problematise elite visual representations of the 9/11 event via comparison with the '9/11 Truth Movement', its so called 'conspiracy theories' and its own visual representations of '9/11 Truth' distributed via online video (http://www.911truth.org/). The epistemic gap (or abyss) between 'elite/mainstream media 9/11' and '9/11 Truth' discourses are indicative of a collapse in industrialised civilization. Such a gap has been termed 'The Parallax View' (Zizek). 'Conspiracy Theories' have been under theorised in social theory. The academy has generally avoided the study of 'conspiracy theories' due to fear of ridicule and potential damage to academic career, despite the dangerous and catastrophic impact of 'conspiracy theories' in world history (for example, the anti-Jewish conspiracy theories of Adolf Hitlerand the Nazis). I will seek to identify intersections between 'conspiracy theories' and such social theory as Ulrich Beck's 'Risk Society' thesis and Reflexive Modernization, particularity in the social politics of contested science and knowledge. In my study 'conspiracy' concepts of, 'The New World Order', 'False Flag Terrorism' and 'Left Gate Keepers' will dialogue with concepts introduced by Deleuze, Zizek, Latour and Baudrillard (Simulacra and Simulation, 'Lines of Flight', Black Box etc). This dialogue may produce intersections and illuminate the epistemic abyss of the 'Parallax View' or the gap between the contested visual representations and meanings of 9/11. Z. Bratich (2008) has used Foucault's concepts of 'truth games' and history of scapegoating to locate 'conspiracy theories' about 9/11 in elite constructions of political rationality and respectability in his book "Conspiracy Panics". New power/knowledge relationships opened up by developments in digital media have been articulated in N. Katherine Hayles theories of the 'post-human' and distributed cognition. An understanding of the materiality of discourse is implied in the ontology of this study and the way in which 'conspiracy theories' about 9/11 have created a new social movement via the internet. I intend to produce an hour long online video to complement the written thesis. This visual material may include an element of interactivity. "Conspiracy Theories" are reflexive knowledge generated in what Beck calls 'sub politics' by a lack of trust in 'the official story' and the ability of key institutions to tell the truth about risk. Reflexivity for Beck is a "self-confrontation" with the foundations of modernity (instrumental rationality). 9/11 conspiracy theories distributed via the Internet therefore seek to question not only the official story but the rationality of modern society.

Reflexive Participant, Reflexive Practitioner: Representations of the visual research relationships. *Sireita Mullings, Goldsmiths University, London*

Arts projects have emerged throughout Britain and other parts of

the world to combat marginalisation of young people. Although the notion of 'marginalisation' is riddled with complexities, the way it is understood and represented through the visual, is of great importance for understanding the sociology of 'British youth'. This paper will discuss the reflexive role of the visual for the artist and researcher. It will examine the application of the visual in rendering creative encounters with youth. Visual methods employed by young people participating on arts projects that permit them to negotiate and articulate their own social constructs through a creative consciousness, are also discussed. The paper will present empirical research findings focused on the 198 Contemporary Arts and Learning (198CAL) gallery located in Brixton, London, where I work as a researcher and arts practitioner. 198CAL runs two projects that utilise visual methods to facilitate the social inclusion of young people. Collectively, through its range of projects practitioners utilise a variety of approaches: visual mapping, time lining, photo journalism and object documenting. A key component is reflexivity which strengthens the creative engagement with young people who deploy photographic ways of exploring and understanding their own lives and the potential dangers of city life. Reflexivity plays a dual role for both participant and practitioner as it is through this process the works of the artist researcher is generated as document of the relationship between the participant, art medium and its impact on the artist as practitioner and researcher. As a result of the seemingly technical, yet organic nature of visual methods, participants, artists, practitioners and researchers find new ways of representing varying social truths. The paper asks; 1) how do young people as both (agents of inclusion) and participants in inclusive arts projects, position themselves socially through the creative artistic process; 2) how do these rich experiences, during a creative transcendence, inform the work of the artist, practitioner and researcher? References Ewald, W., and A. Lightfoot. 2001. I Wanna take me a picture: Teaching photography and writing to children. Boston: Centre for Documentary Studies and Beacon Press. Hyde, K. 2005: Portraits and Collaborations: a reflection on the work of Wendy Ewald. Visual Studies, 20, No.2 Leavitt, J., Lingafelter, T. and Morello, C. 1998: Through their eyes: young girls look at their Los Angeles neighbourhood. In Ainley, R., editor, New Frontiers of Space, Bodies and Gender. London: Routledge. McIntyre, A. 2003: Through the eyes of women: photovoice and participatory research as tools for remaining place. Gender Place and Culture 10, 1, 47-66. Thompson, P. 2008: Doing Visual Research, Routledge. Young, L. and Barratt, H. 2001: Adapting visual methods: action research with Kampala street children. Area 33, 2, 141-52,

095. New National Contexts for Medicine after World War II

4:45 to 6:15 pm

5: 511

Participants:

Leprosy Control and State Medicine in Southwest China. *Shao-hua Liu, Institute of Ethnology, Academia Sinica, Taiwan*

When the communist government firmly established itself in China in the 1950s, one of its first approaches to reach socialist modernity is to set up extensive medical establishments in rural areas and to recruit a mass of grassroots youths for the control of highly prevalent infectious diseases such as leprosy that was endemic in China's warm zones. This paper uses the life history of health workers and leprosy patients to construct the state's medical practices among the ethnic minority populations in Southwest China. It examines how the medical training for community doctors for leprosy control from the late 1950s to 1980s has unveiled three aspects of socialist state medicine in China: (1) the state's gaze at stigmatized diseases and bodies as well as its ideal for hygienic modernity through leprosy control; (2) the recruitment and training of community doctors which demonstrates the shaping of ethos among the medical trainers and trainees in the face of "backward" diseases during the hectic socialist revolutions; and (3) the construction of the recluse "leprosy villages" up in the mountains in the 1960s and 1970s resulting from the state's medical gaze and treatment of the disease in conjunction with local social stigma toward the disease and its victims. The existing research and archives about leprosy in China focus on coastal provinces and Han Chinese areas. Localities like ethnic Southwest China have not been well documented and studied. This paper contributes to our understanding of how socialist China's state medicine has practiced in its massive and borderland regions and entered into a locality where no state power ever existed before.

Picturing a New Cambodian Medicine: Images and Geopolitics in the Revue Médico-Chirurgicale de l'Hôpital de l'Amitié Khméro-Soviétique. *Jenna Grant, University of Iowa*

This paper explores visions of current and future medical science in the first Cambodian medical journal, published between 1961 and 1971 by the Khmer-Soviet Friendship Hospital. The Khmer-Soviet Friendship Hospital, built in 1960 in Phnom Penh with funds from the Soviet Union, was the largest hospital in Southeast Asia at the time. With state-of-the-art equipment and technical assistance from Soviet clinicians, this "vaste cité médicale" embodied the priority of the post-independence Sangkum Reastr Niyum government to promote national development through the improvement of public health and the medical system. The journals, written in French by Cambodian and Soviet doctors and Soviet translators, contain case studies, epidemiological reports, discussions of treatment techniques, and a range of images, including x-rays, photographs, microphotographs, and drawings. What do these texts indicate about Cambodian medicine at the time? Based on analyses of articles, images, prefaces, and citations, there are two interrelated arguments I would like to develop. The first is that it was important to visualize biomedical expertise. Through depictions of ordinarily unseen bodily processes, treatment success, and technological mastery, the Revue demonstrated both the capacities of the hospital and staff and the possibilities for biomedicine as a powerful way of knowing about the body, health, and disease. (There was minimal attention to traditional medicine.) The second argument is that these texts reflected the salience of geopolitics in the development of the medical field. Geopolitical concerns were manifest in the shifting balance of Cambodian and Soviet authorship; in the way authors took care to characterize conditions affecting Cambodians as similar to or different from conditions elsewhere; the affirmation of connections to global science through citation of European and American cases and techniques; and most explicitly, in the Prefaces which comment on the importance of the Khmer-Soviet collaboration for Cambodian medicine, and the importance of medical knowledge for the country and humankind. In its short life, the Revue charted what national (but not nationalist) scientific medicine is and should be, thus positioning doctors from the new Cambodian nation to participate in international medical science. This paper broadens the discussion within STS of the construction of biomedical expertise by demonstrating the centrality of visual depiction and geopolitical referencing in the postcolonial Cambodian context.

Seeking Bare Life in the Therapeutics Past: Leprosy at the Borderland of Empires. *Wen-Hua Kuo, National Yang-Ming University*

This study concentrates Taiwan's leprosy control in a transitional period when it was handed over from Japan to the KMT (Chinese Nationalist Party) regime. It situates its arguments in two sets of literature concerning leprosy control in the history of medicine. The first deals with disease and colonialism. Infectious diseases required social interventions, which went hand in hand with controls initiated by colonial authority. Taiwan, like British colonies in tropical Asia, established its leprosarium through the colonial government, and it continued functioning even after Japan's defeat. The second literature concerns the gap between the availability of curable therapeutics and the social changes upon this progress. Promin, a sulfa drug under testing during wartime U.S., was available in East Asia through various

channels and was widely supplied in the 1950s with other sulfa drugs. Even so, this therapeutic breakthrough did not bring a quick change in leprosy control; instead, it made obvious the discrepancies of public health among East Asian states and reflected a peculiar aspect of the Cold War landscape in this region. Complimenting the above approach and paying particular attention to Taiwan's ambiguous status as both a fortress in the U.S.'s fight with the communist world and a former colony of Japan, this paper intends to achieve a comprehensive understanding of what made the changes of leprosy control policy in Taiwan, the borderland between the fading Japanese empire and the rising world power of the U.S., and a reassessment of the contribution of new treatment in this change. Relying intensively on archives, medical literature, and interviews about how the new drugs were tested, this paper has two goals: to reconstruct this therapeutic past whereby the long-ignored patients' life experiences can be appreciated, and to call attention to the relationships between the state and public health by complicating a one-dimensional colonial account on leprosy control. In any case, it deserves a serious historical investigation.

096. Online Governance in Action

4:45 to 6:15 pm

5: 512

Participants:

Learning from the Internet: How Governance Institutions Predictably Influence System Design. *Hans Klein, Georgia Institute of Technology*

In an earlier article (Klein and Kleinman, 2002), this author argued that institutional theory has considerable explanatory power for the social construction of technology (SCOT). The early theorists of SCOT (most notably Pinch and Bijker, 1984) took an agent-centric approach to explaining technology design, and we noted that well-established theories from organizational sociology could further add to the understanding. Since that time, there has been significant progress in structural approaches to SCOT. This paper takes the institutional argument farther, focusing on large technical systems in general and the Internet in particular. The core claim of this paper is that large technical systems face a priori requirements of governance. Governance of a system consists in the making of decisions that affect a system as a whole -- what Rosenau (19xx) calls "steering" or "ordering". Large technical systems require the performance of five types of governance decisions: system design (including standards-setting,) technical coordination (the allocation of finite system resources,) regulation (rules for the operators of the system,) public policy (rules to control a system's impacts on society,) and international relations (rules to control a system's impacts on sovereign states.) Large technical systems require all five types of governance. A claim about governance is a claim about institutions, because governance occurs within governance institutions. Institutions are established decision-making procedures. As governance processes continue over time, rules of procedure for making governance decisions become established, and those established rules of procedures are called governance institutions. They often take the form of formal organizations, but they can occur as any kind of "social fact", such as inter-subjective belief, tradition, law, or treaty (Durkheim, Rules of Sociological Method.) On-going governance gives rise to governance institutions. The five types of governance identified above give rise to corresponding governance institutions. For every type of governance there is also a theory of good governance. This is a normative theory that defines good process for making that type of decision. Thus for the five types of governance listed above there are associated normative theories. For system design governance, the normative theory might be "let the experts decide." For regulation governance the theory might be "create a free market." For public policy, it might be "system costs and benefits should be distributed equitably." For international relations it might be "the system must respect national boundaries and national sovereignty generally." Sometimes the normative theory is a theory of tradition that simply claims "the ways things are done is the right way to do things" (the essential claim of Burkean conservatism,) but more often the normative theory is independent from existing processes. An independent normative theory allows us to assess legitimacy. When actual governance coincides with norms of good governance, it is legitimate. When [abstract truncated here]

Global Internet Governance in Practice. *Tarek Cheniti, Oxford University*

This paper uncovers part of what it takes to govern the internet. Particularly, it focuses on some of the ways in which governance becomes a lived reality for the members of two ethnographic sites: First Life, and Second Life. 'First Life' is the name I give to the United Nations Internet Governance Forum, a world which likes to think of itself as a space for institutional oversight and consensus-building. It brings together humans and materials who meet to exchange experiences and insights into the way billions of current and prospective internet users should be attended to. Second Life is a realm of avatars and virtual objects who strongly believe in individual freedom and strive to remain immune from the interference of humans and their institutional categories. The paper reflects on some the practicalities of my physical and ethnographic travel across the two lives, particularly paying attention to the scalar politics which are deployed in order to achieve coherence and continuity between the two lives. The paper is a move away from essentialist understandings of governance, which has usually been looked at as a plural phenomenon through the lens of disciplines such as political science and legal studies. Plurality is especially manifest in the persistent treatment of governance as the temporary upshot of different accounts and perspectives on one thing. It is also reflected in an a priori analytic distinction between the institutionalized regimes of global internet governance on the one hand, and, on the other, the less prominent and more mundane forms of governance which individual users are likely to engage in. What the paper suggests is that the domain of 'global policy' and the domain of 'everyday use' are connected through complex, performative, and achieved associations. Governance may come in different versions across the two sites, but it holds itself together as a consistent and coordinated whole. In other words, it is accomplished as a reality multiple.

Governance Online: The Practical Politics of Web-based Feedback. *Malte Ziewitz, University of Oxford*

Over the past decade, web-based feedback has become increasingly popular as a techno-scientific solution to public problems. Following the example of eBay and Amazon, public review and rating schemes now target hotels, teachers, lawyers, websites, restaurants, dates and also public services. Yet, despite such diverse applications, the claims made about these systems are strikingly consistent across sectors. Existing studies commonly suggest that decentralized and public feedback from consumers, citizens and users makes hidden qualities transparent, holds to account those rated and fosters participation and engagement as a new technology of governance. This paper critically assesses existing work by examining what it practically takes to run a web-based feedback system. It does so by telling stories from an ethnographic study of an organization that set out to improve the British healthcare system by asking patients to share stories about their care on a public website and getting providers to respond. Drawing on my experience of becoming a moderator at this organization, this paper will explore the mundane practices that go into soliciting, editing and marketing web-based feedback; it will report on members' attempts to "scale" the model and generate "change" in a complex institutional environment; and it will recount moments of contestation and resistance that occurred when providers or users disagreed with the presumptions of identity and audience implicated in stories and conversations. These observations will provide an opportunity to engage with the complex relations of accountability enacted in the day-to-day negotiations among moderators, patients, relatives, doctors, nurses, managers, web

developers, computers and a database. They will also highlight issues around a number of recurring themes in STS, including ambiguity, authentication, scale, the configuration of users and resistance. The paper proposes an alternative way of looking at governance in digitally networked environments that does not depend on antecedent variables like power, stakeholders, transparency or democracy. Instead, I will argue that what is often portrayed as a straightforward tool of technologically enabled governance involves a complex range of socio-material practices to come into being.

Consumer or citizen? The web-based interfacing of local governments. *Lucia Liste Munoz, NTNU*

The use of Information and Communication Technologies (ICTs) to improve the efficiency, transparency, and responsibility of public governments has been attracting increased research interest. Under the generic label of e-government, this intersection of informatics and governance is believed to constitute one of the most important IT implementation and organizational change challenges of the future (Marche and McNiven, 2003; Warkentin, et al., 2002) and an effort to deal with issues that the parent fields of information systems and public administration appear ill-equipped to deal with on their own (Gronlund & Horan, 2005). Research into e-government activities has mostly followed a deterministic approach towards this government transformation; technological change is presented as a linear, progressive and inevitable path. Such perspectives fail to acknowledge the complex and socio-technical nature of the e-governments projects' trajectories. At the same time, the label of e-government is notoriously unclear and covers a large variety of initiatives. This paper analyzes the webpages of Norwegian local governments. How are these pages constructed to interface with citizens and businesses in local communities? What kinds of information, services, consultation and political participation are provided for? Is the web facilitating access to local politicians and administrators? The study is based on a mapping of the types of information and applications offered on the webpages of all 429 Norwegian local governments, conducted during the summer of 2009. All the municipalities had implemented their own website, but there were considerable variations in terms of what was offered. For example, very few offered any opportunity for interaction with politicians. Regarding e-services, most local governments offered some aspects of this but only a few had many such services available. The most common service was electronic application for place in a kindergarten. Surprisingly many of the major municipalities had not developed their websites as far as some of the small ones. The findings also show how e-government initiatives reflect considerable interpretative flexibility with respect to governance, democracy and public services. There is no clear trend towards closure in the sense that there is an emerging standard with respect to web-based interfaces between local government and the public. Rather, it seems that local governments assume that they are at liberty to domesticate e-government technology according to local resources and ambitions. Thus, there is a variety of web practices but also of the symbolic interpretation of e-government.

097. Public Engagement and Energy Policy

4:45 to 6:15 pm

5: 513

Participants:

Democratic winds: an inquiry into failed participation processes in wind farm implementation. *Eric Jean Jolivet, CRM-CNRS, University of Toulouse I, Capitole*

The Social Studies of Science and Technology have emphasized the importance of component standardisation for the diffusion and the generalisation of an innovation. On the other hand, STS has equally shown that travelling from one place to another place, technological innovations needed to be transposed, adapted, so to speak 'de-standardized' to fit their local context of implementation. Confrontation of standardised material and methods with local idiosyncrasies represents paradoxical situations in which technical democracy and the question of choice by the public becomes both central and practical. One case in point for this double movement of standardisation and de-standardisation is wind power plants. The movement of its gradual elaboration into a growing number of standard components, measurement instruments and calculation tools - immutable mobiles- is now well known and documented. More problematic to the literature is the phenomenon at play when these standard components are implemented in a local site. Controversies and act of resistance did not stop despite of the very consensual nature of renewable energy and wind energy in particular among the public. Participation processes have then been called upon to try to settle down opposition in wind farm development. Theories and methods of participation have been constructed and added to the outfit of standard components available to wind farm planners. In this contribution, we would like to address this issue of failed efficiency of the democratic and participatory methods to bring agreement in practice. We think this situation conveys interesting questions to critically reflecting on the question of public participation and technical democracy as it might have to some extent been taken for granted from political sciences. Our method is based on the analysis of case study of wind farm implementation in the South of France. Interestingly, the project promoter used a number of standard devices and methods in order to frame the project and build a favourable local context to it. This de-standardisation process included participatory method for public involvement and consensus building. The failure of the project in this case, we claim, was actually a failure of the participation process to accurately capture the diversity and voice the public and the issues at stake ie to fit to the local interrelations between people. More widely, this case is an opportunity to reflect about the limits of participation as a social engineering method to properly fit into the process of appropriation of an innovation by a local community. Would local culture not remain to a large extent hidden to such approaches? We suggest that further consideration should be granted to the dynamics of local accommodation and appropriation of novel technical object by local cultures in such situations if we are to get a better understanding on the conditions in which wind farm planners might possibly participate into them.

The social acceptance and bioenergy in Korea. *Jin Hee Park, Center of General Education, Dongguk University*

With the increasing awareness of the climate change, renewable energy draws lots of attention from the public. According to the plan of the Korean government, the electricity production by renewable sources will reach 9% of total electricity production by 2011. Although the result of the government's energy policy has shown progress, the future of renewable energy in Korea seems not so optimistic that the public can approve renewable energy as an important energy source. This skeptical view is resulted from the fact that the government paid little attention on the social factors which could influence on the diffusion of renewable energy. The history of renewable energy shows that not only economical facts such as price, but also social meanings inscribed in renewable energy can be attributed to a disturbed dissemination of renewable energy. This paper aims to show how the social factors may have influence on the development and the diffusion of renewable energy. As a case study, the development of korean biogas plants in the 1970s is analyzed. It was relative early in Korea for the government to make a plan of using biogas as fuel for cooking or heating. In 1969, the Rural Development Administration began to develop a biogas plant appropriate for small-scaled farms. At the beginning, the outcome of the project was so appreciable that in 1975 the total installed plants numbered in 23488. However, the boom of biogas in rural area lasted only for a few years. About the end of the 1970s only the 2,499 plants remained in operating. What made the seemingly successful project fail? An official history of bioenergy using in Korea referred the failure of the project to technical deficiencies such as the design failure of digester. Of course, we can not deny

the main role of technical facility in the diffusion of technical artifacts like biogas plant, but the whole story of the biogas plant seems to need an another explication. The recent studies of renewable energy by the Dutch scholars introduce a new concept of "socio-technical system", which can be applied for STS studies. While the Hughes' technical system focused mainly on production sector, the "socio-technical system" encompasses also consumption und distribution sector. With this concept we can explain the complicated interplay between technological development and social context. In this article I will seek to illuminate how the project of biogas plants had to face with a sharp decline. Not only the technical factors, but also the social and cultural factors which have influence on the development and the diffusion of the biogas plant might come to light, if we review the whole story of the biogas plants in terms of the socio-technical system. This study can provide STS scholars with a new insight into the social contexts and technical system. The renewable energy technologies have been rarely studied by STS scholars. Therefore this paper can also contribute to expansion of the topic area for STS studies.

A study on Consensus Building of Nuclear Technology in Japan. *Naoki Yamano, Tokyo Institute of Technology*; *Masanori Aritomi, Tokyo Institute of Technology*; *Noriyosu Hayashizaki, Tokyo Institute of Technology*; *Hideto Nakajima, Tokyo Institute of Technology*; *Naoki Takuma, Tokyo Institute of Technology*

1. Introduction Sociological research on public acceptance of nuclear energy has been extensively performed in Japan. On the other hand, public consensus building on nuclear technology concerning decision-making process is not overlooked and systematized while a large number of studies have been done in the society such as Public Policy and Science and Technology Studies (STS). In this study, essential components that are necessary to construct the public consensus on nuclear technology are examined systematically and explored as a synthesizing knowledge base regarding consensus building in order to meet better understanding between nuclear technology and society. 2. Methodology The method adopted in this study is analogical components are systematically retrieved from issues/discussions related consensus building among Public Policy, Urban Planning, Social Engineering and STS. We investigated the components on the viewpoint of synthesizing knowledge base and extracted key components on the nuclear consensus building. 3. Key components of nuclear consensus building The public policy is done through consecutive processes of agenda setting, policy planning, policy making, execution and evaluation. Numerous consensus building is requested in the each process at the decision-making of public policy. A number of studies have been performed to solve issues of estrangement between technology and society which became more obvious around 1995. A noteworthy concept is "Co-evolution" which was clearly described by Guy Simon and Shove Elizabeth (2000). The concept was re-indicated by Hiroyuki Torii (2007) as a meaning on the analogy of evolution. The concept is a dynamic mutual change of awareness through affecting by each other. It is able to change collective community of technological regime to the community harmonized with society. In order to launch the innovation, an idea and the normative concept are essentially needed. It is meaningful that a guidance of Social Responsibility (SR) will be notable. The guidance which was voted as ISO/DIS 26000 in 2009 consists of seven principles and seven core subjects. To apply the SR to the nuclear technology, the Safety Culture should be added as a one of principles. In the area of Public Policy, Urban Planning and STS, the concept of public involvement in public sphere is a key component as stakeholder engagement. It is important to build the guideline in order to clarify the definitions of public sphere, object and method for public involvement. The key components are: (1) polling method including focus group interview and deliberative poll, (2) various fields such as forum, open house, science café, stakeholders meeting, (3) risk communication and risk governance, (4) accountability, fairness, transparency, trust building for communication, (5) participation of specialists, (6) participatory decision-making process, (7) method of public hearing, and (8) technology assessment of public policy. 4. Implications for STS It is valuable to establish nuclear consensus building and construct a guideline for stakeholders' communication based on the concept of Co-evolution and Social Responsibility in order to meet better understanding between nuclear technology and society.

When uncertainty comes from the past : the "Atomic French Veterans" and the politics of causation. *Yannick Barthe, Centre de sociologie de l'innovation-Ecole des mines de Paris*

The sociology of collective risks has undergone an important renewal for the past fifteen years. Differing from approaches which considered the perception of risks, the most innovating works in this field have regarded collective risks according to a larger point of view: that of public problems whose emergence, framework and institutional treatment need to be questioned. These works notably attempted to analyze the changes induced by the acknowledgement of the scientific uncertainties regarding certain future threats. But uncertainty can come from the past too. It is the case when a latent period make a causal association between a risk exposure and a disease very difficult to establish. The example of French "atomic veterans", who raise today the question of health impact of nuclear testing, is taken to analyse the situations of uncertainty associated to the past. We show that in this kind of situation, one of the main issue of the controversy lies on the capacity of victims to make credible a connection between exposure and damages even if any scientific evidence of causation has been established.

098. Robots Across Cultures

4:45 to 6:15 pm
5: 514

The mutual shaping of robotics, culture, and society presents a continuing topic of interest in STS. Sherry Turkle suggests that "nascent robot cultures" are emerging as roboticists design machines that no longer merely do things for humans, but to also do things to and with them. Roboticists produce "future imaginaries"—normative cultural narratives about human behavior, cognition, and relations to technology—as an integral part of the social process of technology design and scientific practice. Lucy Suchman's notion of "human-machine reconfigurations" focuses attention on the mutual constitution of humans and artifacts and analyzes how various cultural conceptions can be expressed and reassessed through the practices of robot design. Studying the intersection of robotics and culture allows us to reflect on our conceptions of sociality, cognition, practice, to understand people's interactions with technology, and to reassess how various cultural discourses engage and are developed through scientific practice. This dynamic perspective on the interface of machines and humans can point to changes that can be made in the designs of systems that include humans and machines; it also opens up the possibility for imagining alternative modes of interaction, organization, and knowledge production. This 4S session brings together researchers conducting active studies of human-robotic systems in different cultural contexts. Whether bridging the gap between designers and users in diverse countries such as Japan and the UK, between the people and institutions that comprise NASA or ESA, or between human and machine, the authors in this session focus on ethnographic and interpretive accounts of robots in cultural contexts, the practices that make them animate and legible, and the interactions they inspire at the human-machine interface. Going beyond human-robot interaction, this session aims to explore the concept of culture as diverse possibilities for acting, experiencing, interpreting, and designing socio-technical systems. The proposed session consists of two parts. The first part is a traditional 4S session devoted to talks and commentary, followed by a robotics lab field-trip with all interested 4S participants. We have confirmed a lab visit to Prof. Hideki Hashimoto's Intelligent Control System Laboratory at Tokyo University. We hope to schedule the lab visit over lunch to allow adequate time for the visit. A workshop-style roundtable conversation about our site visit experience, to which robotics researchers from the labs visited will be invited, will follow as appropriate. Paper presentations (60 min) *Carissa Hoareau (University of Exeter), clh218@exeter.ac.uk *Jenny Rhee (Duke University), jsr11@duke.edu

*Selma Sabanovic (Indiana University), selmas@indiana.edu *Janet Vertesi (UC Irvine), jvertesi@uci.edu Discussant (15 min) *Lucy Suchman (Lancaster University), l.suchman@lancaster.ac.uk Open discussion (15 min) Lab visit & discussion (60 min): *Location: "Intelligent Control System Laboratory," University of Tokyo *Host: Hideki Hashimoto (University of Tokyo), hashimoto@iis.u-tokyo.ac.jp

Participants:

The Emergence of Artificial Culture in Robot Societies: An Ethnographic account. *Carissa Louise Hoareau, University of Exeter*

Using ethnographic data collected on an in interdisciplinary project based at the Bristol Robotics Laboratory, "The Emergence of Artificial Culture in Robot Societies" which is looking at the emergence of artificial culture in a robot society, this paper is concerned with showing certain understandings of what culture is and how they function all the way down to the software and technical implementation of these ideas on the project. I wish to highlight how the link between the idea of culture and the embodiment of the robot is transforming in the process of the project. I hope that this will shed light not only on the way concepts are developed in scientific practice but what role culture -and by extensions notions of the human, nonhuman, nature, artifice - plays in the way we think about and act with technological agents in practice. I shall highlight why the idea of culture in the Artificial Culture (AC) project is not understood as an essential property but is constructed by the many attempts to (re)define it in the process of scientific practice - this highlights an area in which the AC project can claim to be doing an emergent, performative science in which not only is the outcome not known in advance but neither are the variables being tested in the lab. There are no fixed concepts and hypothesis - these get "mangled" (Pickering, 1995) in the process of trying to get along with the robots - in the process of scientific practice on the AC project.

Anthropomorphization on Either Side of the Uncanny Valley. *Jennifer Rhee, Duke University*

In my talk, I will look at two U.S. roboticists who take distinctively different approaches to Masahiro Mori's theory of the Uncanny Valley. Mori, a Japanese roboticist, warns other roboticists not to design robots that too closely resemble humans, as this appearance-proximity would produce discomfort for the interacting-human. This theory has held significant sway in much of U.S. robotics. I will look specifically at Cynthia Breazeal's sociable robots, Kismet and Leonardo, and David Hanson's Eva and Philip K. Dick, in order to think about Breazeal's and Hanson's respective relationships to the Uncanny Valley. I will discuss Breazeal's and Hanson's goals for human-robot interactivity, their respective programming and design apparatuses, and the theoretical and ethical frameworks that shape these programming and design decisions. In so doing, I will suggest that these roboticists not only construct their robots and specific modes of interactivities, but they also construct a specific kind of human who participates in these interactivities. In other words, both roboticists elicit anthropomorphization from the interacting-human in very different ways, and from very different conceptions of the human. Heeding Mori's warning, Breazeal mediates anthropomorphization through the complicated nexus of human-animal-machine. I will explore the different anthropomorphic operations at work in Breazeal's hybrid animal-machine and animal-machine-infant robots (Kismet and its robotic descendent Leonardo, respectively). Hanson, on the other hand, designs robots with the aim of human-identicality. Hanson eschews Mori's warning, and instead posits what he calls the Path of Engagement as an alternative to the Uncanny Valley. The Path of Engagement suggests that roboticists investigate human-robot interaction, or sociality, by designing robots according to human-identicality. One could argue that Hanson's robots have more in common with the incredibly human-like android works of Japanese roboticists, such as Hiroshi Ishiguro. While I would not necessarily disagree, in my talk I will propose that we understand Hanson's work through the lens of the robotic imaginary in U.S. culture, particularly in the work of Philip K. Dick. Philip K. Dick's work, which Hanson credits with significantly shaping his robotics approach and philosophy, frequently features human-android indistinguishability in fictional and philosophical meditations on the human and its relationship to the world and technology. While Breazeal's sociable robots are recognizable within the field of social robotics - indeed Kismet and Leonardo are not only recognizable, they are, in many circles, considered the standard-bearers - I will suggest that Hanson can also be understood as existing within a familiar American context, that of the robotic cultural imaginary. I will discuss some of the theoretical, computational, mechanical, and design aspects of Breazeal's and Hanson's robots, as well as the android as a significant cultural figure that first appeared in Dick's work, and continues to significantly influence Hanson's robotic work. In so doing, I will explore the various investments and effects of Mori's theory, as well as of Breazeal's and Hanson's interventions into the theory of the Uncanny Valley.

Engineering cultures: Japanese robotics takes a cultural turn. *Selma Sabanovic, Indiana University, School of Informatics and Computing*

This paper analyzes how the notion of "Japanese culture" is defined and materialized through robot design. Science and technology studies scholars have established that scientific practices and technological artifacts embody socio-cultural values, beliefs, practices, and ways of knowing. In the case of Japanese robotics, the notion of "culture" has become a concept which roboticists use to ground and legitimate their research. In the course of developing a notion of RT—robotics technology with a particular focus on consumer robotics—as a collection of technologies that are used in daily life, Japanese roboticists often refer to the particularities of Japanese culture as legitimation and motivation for their projects. Cultural standpoint is explicitly used as epistemological grounding for the production of knowledge production and technology. My analysis of "culture" as it is described in robotics projects is based on ethnographic field study in Japanese robotics labs, including participatory observation, interviews, and the collection of ephemera. I describe projects which portray robots as materializations of culturally specific ideas, beliefs and practices. I particularly look at the roles robots are given as symbols of Japanese tradition and modernity and as material manifestations and carriers of culture, as mechanical expressions of cultural values and perspectives, and a genre of cultural reproductionI show roboticists drawing on Japanese craft traditions (karakuri ningyo), cultural relations to artifacts (Shinto animism, mottainai), and cultural interpretations of cognition (kokoro, Kansei engineering) to conceptualize their work on advanced robotic technologies and argue for their acceptance by the consumer market. These example suggest the creation of socio-technical imaginaries and arrangements on multiple levels: creating boundaries between Japan and the West, developing connections between Japanese past and the future through scientific endeavors in the present, materializing notions of Japanese values, practices, and subjectivities, and developing particular norms for the relations between humans and machines. This culturally specific "robotics imaginary" impacts not only robot design, but the way in which the society of the future is envisioned and produced. Advances in the field of robotics are described in relation to cultural beliefs, practices, and traditions; the narratives that are being constructed refer to local culture to legitimize robotics research as something that Japanese society is not only interested in, but is particularly amenable to consuming. Concurrently, cultural narratives are reconstructed around the logic and practices of robot design. This redefinition of robotics as an inherently Japanese product not only reaffirms Japan's cultural unity and its place in the global economy, but opens up a space for developing alternative, non-Western, scenarios of advanced modernity and multicultural conceptions of technoscience. This insight leads me to conclude by discussing what this culturally specific figuration of technology means for the development of a more pluralistic conception of science,

technology, and their relations to society.

Robotic Spacecraft in (Sub)Cultural Context - and Conflict. *Janet Vertesi, University of California, Irvine*

Drawing on several years of embedded fieldwork with the Mars Exploration Rover Mission and the Cassini Mission to Saturn, this paper elaborates the role of different contributing instrumental cultures, engineering hierarchies and national infrastructures to the construction and planning of robotic spacecraft missions. I show how, despite their status as single entities constructed by national space agencies, there is surprisingly little homogeneity among each robot's users, whether scientists, engineers or administrators. Thus far from being the product of single relevant social groups with particular concerns, the robots incorporate the competing demands of multiple nations, agencies, and specialized user groups. Divisions between scientists and engineers, between NASA facilities, between nation states, and between participating scientists run deep and are played out through the construction and management of the distant robot. Further, I review the different managerial heritages arising from military or from open source engineering communities, that construct robotic infrastructure along human infrastructural lines. As these competing subcultures with associated differing work practices, allegiances, and forms of talk develop around a single robotic resource, I show how work on the missions produces new configurations of work practices and products as mission members must both construct and negotiate opportunities between opposing groups with conflicting subcultures.

Discussant:

Lucy Suchman, Lancaster University

099. Communication through ICT

4:45 to 6:15 pm

5: 515

Participants:

Tracking web visibility of South Korean politicians: How and why congressional members appear on the web? *Yon Soo Lim, Yeungnam University*; *Han Woo Park, YeungNam University*; *Ting Wang, Yeungnam University*

This study measures the web visibility of the 18th Korean National Assembly members and examines the relationships between the web visibility levels and the politicians' socio-demographic attributes. Prior studies on the Internet politics have focused on politicians' Internet adoption and use. Also, they have been limited in analyzing either normalization or equalization effects of the Internet using organizational websites, such as political parties, civic & advocacy groups, mass media, and governments. Conventionally, the web visibility of individual politicians has been neglected, even though it can indicate the salience of politicians on the web. Further, there has been insufficient research to examine non-English based webosphere. At this point, this study tries to overcome the limitations of the previous research by focusing on the web visibility of individual congressional members in South Korea. Regarding 285 members, Korean-language based web data (blogs, images, news, and websites) that mention their names and "congressional member" were obtained from a top Korean search engine, Naver.com, using an API-based tool. Also, their socio-demographic data (gender, age, consecutive term, constituency, and party affiliation) were gathered from the official site of the Korean National Assembly and their individual homepages. The data were analyzed by several statistical methods, including descriptive statistics, Pearson & Spearman correlation analysis, factor analysis, Kruskal-Wallis test and media test. The results reveal the characteristics of the most visible politicians on the web as well as associated attributes with the web visibility. Politicians who have higher level of the web visibility have brilliant political career and eminence. Statistically, while politicians' demographic attributes (gender and age) are not significantly related to their web visibility levels, their political attributes (consecutive term, constituency, and party affiliation) are significantly associated. The findings in the case of South Korea suggest that an integrated indicator based on web visibility status and political career can provide us with "ubiquitous presence" in digitalized society. This generates further research since the two measures seem to be very differently defined. While web visibility can be operationalized in terms of latent online dimensions, political career can be developed in offline world. This study shows a possibility that political activities are codified in web documents. Furthermore, it makes a contribution to the development of a new field "Webometrics" that deals with quantitative aspect of the web.

Towards a Ubiquitous Network Society, a cross cultural analysis. *Christian van 't Hof, Researcher at the Rathenau Institute and Chairman of the Tagology Foundation*

Our public space is increasingly occupied with electronic devices: camera's, chip card readers, navigation devices, etc. These Technologies help us to find our way, pay, communicate and gain access. At the same time, the rapid adoption of these Technologies triggered societal concerns. In our study we found that in European cultures the discourse is focused on privacy and empowerment, while in Japan the discourse concerns safety and Anshin and Wa. In Europe this development is coined as Ambient Intelligence, while Japan and South Korea use the term Ubiquitous Network Society. Both societies are going towards a smart environment, in which everything is connected to the internet, but deal with it in a different fashion.

e-Social science tools for monitoring a Web-mediated communication in Asia. *Han Woo Park, YeungNam University*; *Steven Sams, YeungNam University*; *Chang Min Lee, YeungNam University*

In order to solve new scientific problems that challenge academics around the world, developing an e-social-science infrastructure and its related tools at the national and global levels is necessary. However, little is internationally known about key projects in the Korean and broader Asian e-science communities. In this interactive workshop, we present webometric tools to automate the social science research process, such as data collection and analysis on the Web; and 2) experimentation with new types of data visualization, such as social network and hyperlink analysis and multimedia and dynamic representations. With the rise of Web 2.0, for example, API-based software has appeared. We have developed several webometric tools created for social networking and micro-blogging service (e.g. Cyworld MiniHompy, Me2Day, and Twitter in South Korea, Plurk in Taiwan), commercial search engines (e.g., Naver and Daum in South Korea), online citizen journalism sites (e.g., OhMyNews in South Korea). The e-research tools enable social scientists to collect large amounts of data automatically and can easily distinguish between different types of information on the Web, which was impossible before. In particular, social science researchers can improve efficiency of data visualization analysis within a specified timeframe using this tool. This presentation illustrates how to use the tools and tries to verify the usability and reliability through several case studies.

Surface Cities: Mobile Manuals for Reading and Handling Cities. *Yanni Alexander Loukissas, Cornell University*

Surface Cities (www.surfacecities.com) is a new research and teaching initiative, established to study the changing images of cities in relationship to information technologies for communication, navigation, and search. This paper describes how we are using mobile technologies in particular to explore new ways of reading and handling cities for a variety of purposes, from environmental activism to extreme commuting. Our approach is to create dynamic, graphic and situated applications that extend or challenge established theories of urbanism. In the fall of 2009, we introduced this approach in a graduate level course in architecture. Students in the course were asked to design and prototype an iPhone application as a contemporary response to 'The Image of the City,' Kevin Lynch's seminal book from 1960 on the legibility of cities. In the process, students

redefined Lynch's elements of the city image (paths, edges, nodes, landmarks, and districts) as hybrid experiences that are part physical, part virtual. The paper will describe the successes and shortcomings of three student projects: ConText is an application intended to raise awareness about the ecological impact of urban production within the city of Boston. The Charles River Esplanade is appropriated by the application as a navigational device for collecting point source pollutants in the form of air, land, and water toxins. Reading the toxin source data as a "text" which could be inserted into the narrative of an existing walking tour, our application attempts to mediate the perceived importance of city monuments, by "polluting" their narratives with the appropriated toxin data. Skysphere is an application that lets users co-create a panoramic perspective of their city in augmented reality. Looking through the iPhone, users see a virtual, facetted sphere in the sky that both reflects and fragments the city. Its size, position, and the density of its facets are a function of the location, number and movement of the users of the application. Subway City is a subterranean application that enables users to create new narrations of Boston while traveling beneath its surface. The application displays the city in section by simulating a visual cut through the city along the subway-line. This experience of the city prompts users to explore new spatial relationships between the city's subway lines and streets. These projects cut across numerous fields (architecture, social science, and computer science) in order to challenge traditional conceptions of the city that are static, depersonalized, and focused primarily on built form. In addition, they suggest new configurations of computers, users and cities that expand the discussion in STS about human-computer interaction (Dourish, Suchman, Turkle) to deal with human-computer-environment interaction.

100. International and Interdisciplinary Collaboration: 6S Student Activity I

4:45 to 6:15 pm

5: 516

In today's globalizing atmosphere we find the social studies of science and technology taking new direction. The aim of this event is to bring people from a variety of disciplines and nationalities together to share experiences, points of view, and ideas for interdisciplinary and international collaboration. An international selection of individuals from the social studies of science will open discussion by sharing their experiences with interdisciplinary and international collaboration. Many in the STS related fields join research teams that cross national and disciplinary boundaries; they may also travel abroad to carry out research or teach. Such crossings are fraught with difficulties and misconceptions that require special attention.

Chair:

Bipana Bantawa, University of Oxford

Panel Members:

Wiebe Bijker, Maastricht University
Daiwie Fu, Institute of STS, National Yang-Ming University
Nina Wakeford, Goldsmiths
Kana Okawa, Graduate School of Knowledge Science, Japan Advanced Institute of Science and Technology
Natalie Hannah Porter, University of Wisconsin Madison

101. The Wild East? Embryos, Ethics and Regulation in China.

4:45 to 6:15 pm

5: 521

Embryonic stem cell research has been one of the most internationally controversial medical technologies of the century, inciting a global debate over the identity of the human embryo and how its worth should be measured against the suffering of fully competent citizens. This conflict has frequently been portrayed as a battle of Christianity versus medicine or, more broadly, religion versus science; cultures which do not have a Christian cultural foundation are frequently seen as standing on the sidelines. Some commentators have even claimed that in non-Christian countries there is no debate over embryonic stem cell research because the embryo has no meaning. China is the most common exemplar of this viewpoint. With its exploding economy and significant investment in science and technology development, China is rapidly rising to a place among the scientific powers. Unlike its colleagues in Europe and North America, however, China is in a position of contemporaneously generating a system of research governance and the philosophical infrastructure necessary to support it. This process involves a complex balancing of the growing system of international norms with a deep-seated cultural tradition which diverges in many respects - emphasis on individual autonomy, legalism, respect for the family - from the intellectual foundations bound up in the emerging field of bioethics. The Chinese government has initiated a series of regulations and guidelines in pursuit of this goal but limited work has been done on the origins and implications of these governance measures. Complicating this effort is the peculiarly complex emotive and ethical context in which embryonic research takes place. Derivation of embryonic stem cells requires the contribution of human reproductive tissues, generally sourced from 'surplus' materials created in the course of fertility treatment. Such materials are not merely the subject of abstract ethical debate but intimately bound up in deeply felt imperatives surrounding heritage, ancestry and parenthood. In this session, panelists present results from a series of comparative studies which examine the practice and regulation of embryonic stem cell research in Europe and China. In particular, the emphasis is on the interaction of sociology and cultural background and emerging technologies; the way in which lived experience and interpersonality shapes the interface of reproductive technologies and medical research. Analysis includes consideration of the broader implications of these interactions for the ethical regulation of emerging biotechnologies in China and the wider world. Studying the Chinese case offers insight not only into the experience of developing countries in assimilating and governing potentially powerful emerging technologies but wider questions of how the epistemological foundations of inter-cultural normativity can be harmonized to allow for global norms. The session consists of four 12 minute presentations, a 12 minute discussant talk and a full half hour of open discussion. This format was selected to permit greater opportunities for synthesizing study results and collaboratively reflecting on their joint implications for policy and practice. Time permitting, discussion will include a broader dialogue about the experience of cross-cultural ethical research and its methodological and research design implications.

Participants:

Ethical genealogies: diversity, conformity and silences in the regulation of hESC in China. *Achim Rosemann, International Science and Bioethics Collaboration Project, University of Sussex*

The paper explores a range of social and cultural issues around the use of human embryos for hESC research in the context of China and discusses these in the light of debates on the formation and stabilization of ethical epistemologies and related regulatory approaches as emerging at the intersection of science, political power and national interests. The paper advances along two interrelated lines of argumentation. First, based on an empirical investigation of the viewpoints and experiences of embryo donors, IVF clinicians and hESC scientists, I shall illustrate that ideas on the value of early embryonic life forms and on the legitimacy to donate and use these tissues for hESC research are much more complex and diverse in China than commonly suggested. I shall exemplify that the wealth of culturally informed assumptions on early forms of human life as well as the multiplicity of related beliefs and normative restrictions that were articulated by my informants, contradict a range of widely upheld claims: assertions as made by Chinese political leaders that religion-based scruples do not exist in China (Sleeboom-Faulkner and Patra 2008), Confucian-based lines of ethical reasoning - as used in legitimation processes of the current regulatory approach in China - according to which a person is only considered to be fully human after birth (Qiu 2000) and assumptions formulated by Western observers that the value of early forms of human life in China is low (Cookson 2005). Based on empirical evidence I shall demonstrate instead, that forms of embryonic life in China are entangled in a rich web of culturally mediated forms of meaning, value, values, emotions and social relations, whose integration in policy-making processes in China has systematically been excluded. The data on which I draw here are

based on a survey (N=550), conducted among IVF patients as well as university students, and on fifty in-depth interviews with IVF patients, clinicians and hESC scientists conducted in five IVF clinics and six stem cell centres in Central and Southeast China. In the second part of the paper I shall reflect on these findings in the light of a discussion on the relationship between science, science policy and the politico-institutional landscape in China, which is interesting especially due to the absence of an autonomous domain for public debate and the close incorporation of bioethics institutions into state structures, which offers evolving chances of engagement, but only limited space for independent insights and suggestions. By focusing on the discrepancies between the perceptions of embryo donors and the assumptions and interests that underlie current approaches of ethical governance of hESC research in China, the study intends to contribute to debates on the significance of "sociotechnical imaginaries" (Jasanoff and Kim 2009) by non-experts on the one hand, and on the formation of ethics, science policies and participatory components in non-democratic state systems on the other (cf. Halffman 2005, Nowotny et al. 2003, Salter 2008, Stirling 2008).

A transnational view on the ethical impacts of IVF treatment and embryo donation. *Anika Mitzkat, Institute for History, Philosophy and Ethics of Medicine, Johannes Gutenberg University Mainz*

According to the "Ethical Guiding Principles on Human Embryonic Stem Cell Research" promulgated by the Ministry of Science and Technology and the Ministry of Health of the Peoples Republic of China on December 24, 2003 (MST/MoH 2003) the derivation of human embryonic stem cells (hESC) from spare gametes or embryos after in vitro fertilization (IVF) is allowed with the voluntary agreement of the couple. One of the obvious ethical questions regarding the organization of the interface of in vitro fertilization and stem cell research is how patients can make an independent and morally responsible decision, and how far they need to be protected against the risk of undue inducement or exploitation. IVF patients who are asked to donate embryos for scientific research are not only vulnerable as persons with an individual history of suffering and patients in a powerful institutional setting, but also because they might struggle about the decision what should be done to the embryos they do not need for fertility treatment (Scully/Rehmann-Sutter 2006). It has been hypothesized that a number of factors may affect the decisions made regarding the fate of surplus embryos, including the range of options available according local and national rules, gender, age, changes in the family situation, the time at which treatment is offered, the degree of information about the possible application of stem cell research and the type of research carried out with the surplus embryos (Luna 2009, Hug 2008). Qualitative empirical studies on this topics in countries such as UK, Denmark, Switzerland or Belgium show that woman and couples respond to a complex social and moral challenge, which interacts with local social and cultural context (Haimes/Taylor 2009, Haimes et al 2008, Provoost et al. 2009, Scully et al. 2009and 2008, Svendsen/Koch 2008, Svendsen 2007). In this contribution, findings from qualitative interviews with woman after undergoing IVF treatment and from participant observation in a major Chinese centre for reproductive medicine (Mitzkat 2009) are reflected in a broader context. Transnational differences and similarities concerning the experiences of involved persons regarding the moral impacts of IFV treatment and embryo donation as well as their consideration concerning "spare" embryos will be discussed.

A Tale of Two Labs: Biomedical Science Governance in the PR China and the United Kingdom. *Thomas Streitfellner, University of Vienna*

In the past decades the new biomedicine and especially stem cell research led to numerous policy controversies around the globe. In this paper I approach these policy developments from IVF towards stem cell therapy as a micro-level problem. Comparing two in-depth case studies of bench research from the People's Republic of China and the United Kingdom, I show how national narratives, individual desperation for therapies and new science governance via "imagining regulation" have led to global convergence - despite of local political and cultural diversities. A result of three years cross-cultural STS research, the paper examimes this process of standardisation of research practice on the local levels which is increasingly moulding a convergent, global policy landscape. It seems that 21st century biopolitics is increasingly affected by convergent transnational collaborations between public and private research laboratories - across traditional political boundaries marked by regimes and regulations. Hence global science governance might be different than we thought.

The Egg and the Family: the impact of traditional familism on stem cell research in China. *Megan Allyse, Center for Biomedical Ethics, Stanford University*

One of the more contentious debates in the history of the contestation of embryonic stem cell and somatic nuclear transfer (SCNT) research internationally has been the requirement of such research for healthy, ex-vivo human oocytes. Retrieving oocytes is an invasive procedure requiring hormone treatments and the risk of surgery. Given the growing number of women who suffer medical conditions that render their own oocytes unsuitable for use in reproduction, a complex bioeconomy has grown up around the exchange of ex-vivo oocytes between women. Such exchanges are frequently contested as being inevitably contributory to the coercion of women, especially when remuneration of money or services is offered. The introduction of the stem cell lab as a third actor in this market has been heavily contested in many international venues. This contestation was exacerbated by reports that the head of a South Korean laboratory was employing social coercion to encourage junior employees to contribute oocytes to his research. The intense discourse surrounding oocyte contribution has revealed interesting divisions in the normative significance of oocytes depending on their context. The most extreme division can be seen in the current regulatory regime in California, where offering financial compensation in exchange for oocytes destined for use in fertility procedures is a free market but any and all forms of remuneration in exchange for oocytes intended for use in research is forbidden. These outcomes raise questions about the meaning of reproductive tissues when removed from the context of reproduction. They also have implications for understanding socio-cultural valuations of the role of the woman in society and the constant tension between paternalism and protection of the vulnerable. Based on in-depth qualitative interviews and documentary analysis carried out over three years, this project focuses on understanding social and political responses to the advent of oocyte contribution to SCNT research in China, California and the UK. This paper explores the regulation of oocyte contribution to somatic cell nuclear research in China. As in California, ex-vivo oocytes are politically bifurcated depending on their intended destination; the normative regime governing oocytes in fertility procedures differs slightly from that which controls the contribution of oocytes to research. Using a newly developed Political Stabilization of Technology model, the author analyses the lifecycle of oocyte extraction technologies within the private and public spheres of Chinese society in an effort to understand this bifurcation and its implications. Results include attention to the socio-political role of the consanguineous family in Chinese society and governance and the effect this has on the boundaries between the private and public spheres. Communitarian concerns about the impact of oocyte exchange on social stability motivates greater government attention to the use of ex-vivo oocytes in the private reproductive context than the public research context. These results have implications for existing discourse surrounding the meaning of reproductive tissues in the Chinese socio-cultural experience and the normative role of the Chinese State in the stabilization of contested technologies.

102. Science Literacy

4:45 to 6:15 pm
5: 522

Participants:

Science literacy project in Japan. *Kazuo Kitahara, International Christian University*

Since 2005, more than 150 scientists, science communicators, educators, industry people etc. have been working together to clarify what are basic knowledge, skill and concepts of science and technology to be shared by all people for the democratic sustainable society and in 2008 we published reports on seven areas such as "mathematical science", "material science", "life science", "human and social science", "earth, space and environmental sciences", "informatics", "technology" and the integrated report. These reports are now becoming the basis for science communication movement, quality assurance of higher education, policy of science museums, improvement of secondary education curriculum and so on. ; so that

The survey of scientific literacy for science communication about solar power generation in local community. *shishin kawamoto, Tokyo Institute of Technology*

We surveyed scientific literacy for the purpose of applying the results to science communication. Scientific knowledge and methodologies (scientific literacy in narrow sense - first phase) and interests and attitudes toward the society and science and technology (second phase) are the bases that support social judgments and actions (third phase), but expressions and acquisitions of scientific knowledge and methodologies in the society are naturally affected by social interests as well as judgments in the society and action capabilities. We thought that such a literacy structure has a specific tendency and such a tendency can be captured by questionnaire surveys. Under this premise, we set out to find what kind of relations science and technology of narrow sense has with other elements, and grasp what kind of groups of people having what kind of literacy structures (literacy clusters) exist , through questionnaire surveys. The survey was made via the mail to adults Japanese (over 18 years old). The survey was made March 18-April 7, 2008 and 1286 responses were collected. As the result, three literacy factors were extracted from the responses to the three query groups of interested fields, attitudes and interests on science and society, and evaluations on science and society, totaling 65 queries by factor analysis. The first factor (scientific factor) is a factor related to interests in science and technology, capability of using tools and equipment, and general approval of science and technology. The second factor (social factor) is a factor related to interests in various fields other than science and technology and recognition of social and environmental issues. The third factor (science-emphasizing factor) is a factor related to one's trust for scientists and values of science. These factors and the score of the 13 scientific knowledge queries were analyzed by correlation analysis. The four literacy clusters were clustered by these factors by cluster analysis. Cluster 1"Inquisitive type" is a cluster in which the all factors are high. Cluster2"Sciencephiles" is a cluster in which science factor is high, social factor is low, and science-emphasizing factor is middle. Cluster 2 tends to have many young male. Cluster3"Life-centered type" is a most large cluster in which the social factor is high, science factor is low, and science-emphasizing factor is middle. Cluster 3 tends to have many female. Cluster4"Uninterested type" is cluster in which the all factors are low. Under the result, we designed the simplified questionnaire by using a multiple regression analysis. The ten questions were selected to classify respondents into four clusters. Using the simplified questionnaire, we conducted survey in many science events. In the results, most of participants were cluster 1 and 2. It is necessary for improvising scientific literacy to prompt to involvement the various clusters. In Kakegawa city, the city office and the citizens are promoting the introduction of the photovoltaic generation. We survey relation between the scientific literacy and consciousness on the issue about solar energy to design communication. We will report the detail of the result.

Neuroscience literacy and its social implications. *Ryo Uehara, Japan Society for the Promotion of Science*; *Eiske Nakazawa, University of Tokyo Center for Philosophy*

1. Backdrops: The need for neuroscience literacy Neuroscience and its technological applications such as Brain-Machine Interfaces (BMIs) could make great impacts on our society and daily lives. However there is, especially in Japan, an enormous gap between the general public and neuroscientists, and the expansion of this intellectual gap seems to work not just against the former but against the latter. Thus we must investigate and develop more effective methods to promote mutual understanding between them. The aim of "neuroscience literacy" (NL) is to achieve this. 2. A research program in neuroscience literacy A research program "Enhancing Neuroscience Literacy through the Use of a Textbook Designed for both Humanities and Science Students" had been held from 2006 till 2009. The target of the NL research program was undergraduate students both in humanities and in science. We compiled a textbook of NL and had classes based on it. 3. NL education as a science communication We need a middle-stage neuroscience communication which bridges a gap between the deficit model and the interactive model. Because of that, even if we introduce a neuroscience communication based on the interactive model, it is not likely that the general public communicate well with neuroscientists. We characterize NL as a middle-stage science communication based on the "contextual model." It includes the following three points: (1) the general public will learn basic neuroscience in respect of their own interests and significance, (2) they can comprehend their lives and societies from neuroscientific perspectives, and (3) they will prepare interactive communications with neuroscientists. From such a perspective, our NL research program has set the following goals: (1) students will understand the social significance of neuroscience, and (2) students will change their understandings of human beings and of themselves. Toward these goals, we compiled the textbook and have 15 classes for undergraduate students. 4. Reflections and problems The problems revealed through writing a textbook and having the classes were as follows: (1) Because to understand the social significance of neuroscience contains practical skills and knowledge corresponding to various situations in the real world, it cannot be fully mastered without exercises and training. (2) The change of understanding of human beings may influence the students' self-conceptions by suggesting the limitations of human beings. Thus we should emphasize that the neuroscience literacy education can make the students to acquire not only basic neuroscientific knowledge, but also intellectual attitudes and social personality traits. (3) Nonetheless we should teach our students the limitations of neuroscience itself as a science in the making. However, we can teach this very situation as a case in which science in general takes a dynamic relation to human beings and society. 5. Prospects NL education is a quite epistemological project since it will better contribute to the production of knowledge useful for individuals and society. As far as the theory of science communications in general is fundamentally connected with the philosophically classical task of how we conceive a desirable society, philosophy could make a fruitful contribution to it.

Half-Academic: Mode 2 Science and Career Path of Researchers. *Yuko Murakami, Tohoku University*; *Miwa Kuri, Tohoku University*

This paper aims to point out the existence of communities of "half-academia" as a subgroup of those who currently conduct mode 2 science. Half-academia consist of Ph.D. holders who work in local communities. The phenomena is observed only in those research areas in which Ph.D. holders can pursue professional careers outside of academia; which coincides with the intersection of the following: a) Areas to which governmental or other funding agencies allows researchers outside of academia to apply for their fundings (security and safety, environmental issues, etc) b) Areas in which local governments need

professional supports The phenomena of mode 2 knowledge production were first explicitly observed around late 1980s. While Gibbons [1991] first points out that it is a consequence of popularization of higher education, our hypotheses are: (1) that the actor body of mode 2 science has shifted from college graduates to Ph.D. holders in the recent two decades; and (2) that the phenomena are consequences of paucity of academic positions in universities and research institutes which is associated to popularization of graduate education in Japan in the 1990s. The hypotheses will be supported by (1) interviews of Ph.D. holders in geological science in non-profit organizations in Japan and the previous questionnaire by the career support group for young geoscientists, Japan Geoscience Union (2009); (2) statistics of the number of granted Ph.D. and that of academic positions; and (3) In the USA and Japan, it was the late 1980s job security of Ph.D. holders in academia began to be unstable at the same time as extension of higher education was politically stopped. Ph.D. holders without academic positions have found their way as professional scientists in "half-academic positions." Since they need to support themselves, the phenomena are in practice limited in research areas in which governmental or other funding on research and related activities are available for non-academic institutions; for example, environmental science for preservation of local environment, or geological science for eco-tourism and safety. Nevertheless, services in those fields have been considered to be freely provided, because either the actors had been amateur scientists who do not expect little income from those activities before those with professional training began to join, or companies sponsored those activities as parts of social actions during booming economy in 1980s. Science communication between academia and half-academia does not fit the standard recommendation for scientists in a traditional sense of two-way science communication to listen needs of non-academic stakeholders, since most participants are professionally trained scientists in the current framework. Those who are out of academia but in half-academia need most of heavily context-dependent science communication skills. Our hypotheses thus suggest that (1) the recent policy to lead career paths of Ph.D. holders toward science communicators are misleading and will not be effectively realized without budgetary supports of the activities in half-academia; (2) science communication is in turn essential in half-academia, but only on-site training of communication are effective in addition to skill trainings of research management, because of divergence of local needs.

A study of science education in Japan that values and fosters Interprofessional Collaboration. *Akinori YAMABE, The University of Tokyo*

Modern day issues in science and technology arise from a complex background, one that encompasses many different areas of knowledge. When developing public policy with respect to science and technology and its relationship to society, it is necessary to draw upon a broad range of specialties and professional expertise. Interdisciplinary, interprofessional collaboration between scientists is so important that it should not be limited to emergent problem solving, but, instead, should be developed and trained as part of the education process. The field of medical treatment and healthcare has already recognized the above ideas, as can be seen in its emphasis on "team medicine," and in its efforts at a new education to help encourage it. Interprofessional education (IPE) has become a key element in this new education. The U.K.-based Centre for the Advancement of Interprofessional Education (CAIPE) elaborates on IPE - what it is, what it can achieve: "Interprofessional Education occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care." IPE has been shown to have the following effects: works to improve the quality of care, focuses on the needs of service users and carers, involves service users and carers, respects the integrity and contribution of each profession, enhances practice within professions, increases professional satisfaction. All of the above can help us better answer the question of "Whom can science and technology better serve?" A growing intersdisciplinary/interprofessional approach bas been seen not only in IPE, but also in the focus on interdisciplinary education (IDE) within the liberal arts. As for science education, it seems that synchronization of IDE with IPE will become increasingly important in the future. This study includes a comparison between IDE and IPE, and considers the application of IPE to science education. This study focuses on IDE and IPE in universities in Japan, particularly in science education at the University of Tokyo. Based on above, this study aims to contribute to the findings and conclusions of 4S with respect to education.

What do laypersons want to know about the Universe? *Yoshiko Saitoh, Nagoya University*; *Kazuhisa Todayama, Nagoya University*

Backgrounds We have seen a number of popular science books written in Q&A style. In many cases, the questions are selected by authors who themselves are scientific experts. We conducted "The Hundred Mysteries of the Universe" project in order to give laypersons the initiative in choosing topics. We invited people to sending questions and collected about 1,000 questions. The graduate students and professors prepared answers and uploaded them on the website. The unique feature of the project is that, contrary to the usual science Q&A books, the questions in our project were raised not by scientists but by laypersons themselves. Some of the questions were beyond our anticipation and quite confusing for the experts. Aim The present study aims at clarifying the characteristics of layperson's scientific interest focusing on the perplexing questions as well as the gap between what laypersons want to know and what experts want to tell them. Method In the first place, we excluded non-questions such as opinions and claims. Then we classified and analyzed the remaining 951 questions according to the three axes as follows: 1) Topics (heavenly bodies, the universe as a whole, life forms, observation and astronomy, physical concepts and theories, physical matters, culture and philosophy, UFOs and other supernatural phenomena) 2) Epistemological nature of the expected knowledge (giving information, explanation, validation) 3) How the question arose (finding contradiction, doubt, extrapolation and diversion of knowledge, viewing from another angle, future expectation, etc.) Finally we sorted out questions which the experts found difficult to answer and extract the major characteristics of them. Major findings 1. The topics questioned by laypersons are partially distributed. Questions are concentrated on the beginning of the Universe, the end of the Universe, Black Holes, extraterrestrials. On the other hand, few questions are raised about movement of planets, the origin of a solar system, calendars. 2. The questions difficult to answer are classified into these five categories. (1) Beyond the scope of science in principle, (2) scientifically meaningful but unanswerable under the present state of scientific knowledge, (3) stems from misunderstanding of scientific concepts, (4) stems from confusion between normal cases and special cases, (5) stems from insufficient understanding of theories or facts. 3. The questions that experts could answer but have difficulty in expecting are classified into these six categories. (1) Interprets scientific facts or theories within a framework of everyday experiences, and asks for the resolution of resulting contradictions, (2) puzzled by a misleading explanation from "popular science", and asks for the resolution of resulting confusions, (3) asks for scientific expositions of everyday astronomical phenomena, (4) discloses one's own personal experiences, and asks for scientific interpretation of them, (5) extrapolates everyday experiences to the outer space, and asks what we would see in the counterfactual situation, (6) Asks what benefit could research and development of space bring to our life. Possible contribution to the STS literature We hope our study will serve for understanding the structure of scientific knowledge among laypersons, and for betterment of science communication.

Understanding the Public with the Concept of Cultural Capital through a Scientific Institute's Outreach Event. *Naoko Kato-Nitta, Sokendai, the Graduate University for Advanced*

Studies, Japan

This paper explores the relationships between individuals' attributes as well as past behavioral tendencies and their responses to a scientific institute's public outreach activity. Focusing on a one day public open house event held at one research institute in 2009, anonymous questionnaire forms were distributed among 1,350 visitors and collected 785 cases (collection rate 58%). In this survey, the relationships between the participants' individual attributes and their preferences or satisfaction levels for the exhibits were investigated. Individual past visiting frequency and length of the current visit at the exhibition were also investigated. Considering science as cultural production, individuals' cultural capital using self-reported involvement in scientific activities including attending science cafes or subscribing scientific magazines as well as activities in art, music, and literature in past five years was measured. Given these capital ratios, correlations between citizens' accumulation levels of cultural capital and scientific consumption were studied. Referring to the concept of cultural capital developed by Bourdieu, the statistical analysis with the two components of cultural capital (science and technology / art and literature) may promote our understanding of the "distinction" of science for Japanese citizens.

103. Women Body and New Technology

4:45 to 6:15 pm

5: 523

Participants:

Emancipatory, suppressive, or equalizing - and for whom? Feminist theory and reproductive technologies. *Malin Noem Ravn, Dept. of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology*; *Kristin Spilker, Department of Interdisciplinary Studies of Culture, NTNU*

Reproduction and reproductive technologies have always been of central concern for feminists and feminist theory. This may be of obvious reasons, since women's reproductive capacities have been understood to be the very base of the suppression of women. Not so obvious though, are the position taken by feminist theorists towards reproductive technologies and their possibilities; they have for instance both been understood as emancipatory, liberating women and giving them freedom to choose and control their own reproduction, and as suppressive, through being a patriarchal tool, assuring men's control over women's bodies. In this presentation we will focus on feminist positioning towards various forms of assisted reproductive technologies (ART), from the ideas conceived by the possibilities of the first test-tube babies to more recent and various forms of IVF, such as sperm- and egg donation. Through a literature study of selected articles we will investigate the diversity in the feminist understanding of the political potential in ART, and we will show how this diversity mirrors different co-constructions of gendered bodies, nature, technology, parenthood and gender equality. We will explore how the historic line of gender theory and feminist STS studies have framed issues of ART, and also ask if there is any connection between the early positions and contemporary perspectives. Charis Thompsons concept of 'Ontological choreography' (2005) points to the careful composition of elements that make up our present understanding of assisted reproduction as well as parenthood. Summing up we will point to the Norwegian case, and show how the contemporary national discourse on equal rights constitutes a fundamental element in the policy-making concerning assisted reproduction. How does the Nordic welfare state model picture equality when it comes to assisted reproduction - who is to be equalized? Man and women, bodily gametes of egg and sperm cells, homosexuals and heterosexuals, gay and lesbians? And if these groups are to be equalized, what new ethic dilemmas will this bring to feminist theory?

Gendering 'Crypton': Fluid Gender of Material Substance. *Seppo Poutanen, University of Turku*; *Anne Kristiina Kovalainen, Turku School of Economics*

This paper will analyze the gendering process of a material substance and its use. Furthermore, we will analyze specific innovation and patenting processes related to the substance. The material substance in question is titled as 'Crypton'. We will use the acronym 'Crypton' in order to protect the identities of both the inventor and the corporation in question. Crypton is among the top 100 chemicals produced worldwide. Naturally occurring 'Crypton' is chemically processed into a pure material available for use. The specific innovation process we analyze is related to the chemical production processing of the material, enabling more a cost-effective and reliable production, and adding widely the usability of 'Crypton'. As a material 'Crypton' is odorless, neutral, absorbent and generally safe to use. How the gendering process of neutral, colorless and odorless 'Crypton' takes place through the surface of different bodies, is in the focus of our analysis. We will also analyze the gendering of innovation and patenting processes and the IPR questions within the corporation context. We will contribute to the STS-literature through the articulation of gendering processes taking place in different contexts of the use of 'Crypton'. Furthermore, we will specifically relate our theoretical discussion to enacted bodies (e.g. Mol and Law 1994, 2004) and to feminist STS-literature more generally. The paper is based on a case study of one invention process that took place in a production factory, partially related to the ingredients close to 'Crypton', among others with a patent related to 'Crypton' and a new production line for 'Crypton' as the outcome effects of the invention. The material used in this paper consists of c. 6 hours of in-depth interview materials and documentary materials. The methods of analysis used are critical close reading, content analysis and narrative analysis of the material. This paper is part of our larger research project funded by the Academy of Finland.

Making the Body Visible: Backscatter X-Rays and Intersectional Feminist Theory. *Shoshana Magnet, University of Ottawa*

Backscatter X-ray technologies are new forms of security cameras that are now being deployed at airports across North America. Backscatter X-rays produce images of the naked human body, revealing its contours and outlines beneath an individual's clothes. Although backscatter X-rays are marketed as advanced visualization technologies able to keep the nation safe, in this presentation, we call these claims into question. Rather, drawing on Angela Davis' intersectional feminist analysis of the strip search as a form of state sponsored sexual assault, we examine the consequences of an electronic strip search for substantive equality. In particular, this case study examines their ramifications for transgendered and transsexual communities, as backscatter X-rays are identified by the National Centre for Transgendered Equality as one of the most pressing issues facing trans people today, in large part because they hold up the possibility of "outing" trans airline passengers by revealing prostheses and differently gendered bodies. Asking questions including: What does it mean to make visualizing the naked body on a screen a prerequisite for travel? What are the consequences of representing traveler's bodies for mobilities? this presentation aims to complicate assertions that an electronic strip search is simply a way of speeding up air travel and keep citizens secure.

The Princess and the Pooper: Constructing Adequate Humans with Japanese Lavatory Technologies. *Tom Hope, Tokyo Institute of Technology*

It is a cliche to write about the extraordinarily advanced toilets one encounters when visiting Japan. Yet it is true that, while there are certainly innovative public lavatories in other regions, Japan leads the world in the domestic purchasing and public use of what have been termed "robo-toilets" (George, 2008). In a 2009 study conducted for the Japanese government, just under 70 percent of households had some sort of toilet with a heated seat and posterior washing function (often known by the TOTO brand name "washlet") (Cabinet Office, 2009). In use, these high-tech

toilets can be understood as intimate interfaces between humans and machines, and as such they could be hailed as an example of designers giving the users what they want. Indeed, this is the narrative given by the producers of one associated type of product, the "oto-hime" or "sound-princess", an electronic device or function of these toilets that generates noise to mask the sound of passing urine, gas, or defecating. However, this narrative is highly gendered, and sits within ever-strengthening discourses of health, environmental awareness and responsibility. The development of the interfaces have, due in part to their intimate nature, been relatively limited from a user-perspective. Work in the social studies of science and technology has explored case-studies of public acceptance of technologies including those of the bathroom (e.g. Asano et al, 1996; Stenekes et. al. 2006). Behavior in bathrooms and the relationship to infrastructure has been explored (Shove et. al, 2004), and there is a large body of work investigating the role of sanitation, public health and policy (e.g. Vliet et al, 2010). Relationships between public lavatories and gender have recently been explored in some depth (Gershenson and Penner, 2009), although discussion on Japan tends to be limited. This paper examines the convergence of technologies, cultural practices, and discourses that gave rise to, and continue to support, the shape and use of public conveniences in Japan. Through textual and qualitative interview data, it shows how knowledges of human lavatory practices, once developed, are translated into 'adequate' behavior, technical design and public policy. The paper contributes to understandings of the socio-technical construction of private and public space, gender and identity.

104. Nuclear Exposures. Contested Sites of Biomedical Knowledge Production

4:45 to 6:15 pm

5: 524

Radiation has played a key role in the development of molecular biology and biomedical research. As tracers and mutagenic agents, radionuclides were used as experimental tools in the life sciences throughout the atomic age. Outside the laboratory of molecular biology, epidemiologists performed studies on the effects of radiation among "populations" exposed to different types and doses of environmental radiation. This panel will examine the various ways in which biomedical science has followed up on health effects of nuclear weapons - from genetic studies among the atomic bomb survivors in Hiroshima and Nagasaki to cancer epidemiology in populations exposed to radiation due to atmospheric nuclear testing. From post World War II studies of atomic bomb survivors in Japan to biomedical investigations of fallout exposures for instance in the Pacific and Central Asia, this panel will focus on how molecular understandings developed alongside the investigation of radiation effects. Our papers deal with a broad range of biomedical research fields - from genetics, pathology, cancer and aging. The panel will trace how radiation research has co-shaped concepts of disease during the second half of the 20th century. This panel will contribute to the science studies literature on nuclear issues risk, including historical accounts of US/Japanese medical research programs after Hiroshima and Nagasaki (e.g. Lindee 1994), laboratory studies of radiation and cancer genetics, anthropological studies of lives exposed and implications for citizenship after Chernobyl (e.g. Petryna 2002). Contributing to these bodies of literature, our case studies take their points of departure in the social and epistemic configurations and material objects in radiation effects research. The paper by Crispin Barker (UC Berkeley/ETH Zurich) explores aging studies conducted by the Atomic Bomb Casualty Commission and examines how research into radiation-induced accelerated senescence contributed to redefining aging in terms of molecular biology in the 1950s and 1960s. Hiroko Takahashi (Hiroshima City University) follows the controversies surrounding pathological specimens from a crew member of the Japanese fishing boat "Lucky Dragon" who was exposed to fallout due to US nuclear testing on Bikini atoll. Aiko Takeuchi-Demirci (Brown University)'s paper deals with genetics and fertility studies of the Atomic Bomb Casualty Commission in postwar Japan, and their implications to American genetics. Susanne Bauer (Max Planck Institute for the History of Science, Berlin) explores how fallout studies have shaped cancer epidemiology during and after the Cold War; this paper looks in particular into research on Soviet nuclear testing and traces how radiation epidemiologists "take advantage" of local exposure situations to generate global radiation risk estimates for different population subgroups. Together, these case studies of biomedical research programs in the aftermath of nuclear weapons programs will enhance our understandings of how research into radiation effects has co-shaped contemporary biomedicine.

Participants:

Aging and the Atom: The Gerontology Program of the Atomic Bomb Casualty Commission. *Crispin Barker, University of Zurich*

Crispin R. C. Barker, Ph.D., University of California at Berkeley, ETH Zurich In 1953, when tabulating the 1951-1952 death certificates from Nagasaki and Hiroshima, the epidemiologists of the Atomic Bomb Casualty Commission (ABCC) discovered a new kind of injury caused by exposure to the high levels of ionizing radiation released by Fat Man and Little Boy: female residents appeared to be aging nearly twice as quickly as their unexposed fellow citizens, and males up to four times as fast. Studying the accelerated senescence of Japanese survivors soon became the focus of the ABCC and its director, Robert Holmes, pushing expenses far over budget and leading to a serious rift with the National Research Council administrators in Washington, D.C., whose own experts dismissed the existence of the phenomenon. This talk, based on a detailed analysis of the correspondence, research reports, and records in the Atomic Bomb Casualty Commission Collection at the National Academies Archives in Washington, discusses the rise and fall of the statistical evidence for radiation-induced senescence and how the disputes over interpreting the data and designing the gerontology program were responsible for the comprehensive overhaul of the ABCC's goals and research methods in 1955 (the Francis Committee's Unified Study Program), as well as a factor in the Commission's formal alliance with the Japanese National Institute of Health in 1957. Earlier historians of the ABCC, radiation biology, and gerontology have overlooked the significance of the aging studies in Hiroshima and Nagasaki, and hence how they (and the parallel research by Atomic Energy Commission scientists on the accelerated senescence of Marshallese Islanders irradiated by the March 1954 Castle Bravo hydrogen bomb test) contributed to redefining aging in terms of molecular biology in the 1950s and 1960s.

The Treatment of the Specimen of Mr. Aikichi Kuboyama: Controversy on a Victim of Nuclear Test. *Hiroko Takahashi, Hiroshima Peace Institute, Hiroshima City University*

On March 1, 1954 the Japanese fishing boat "Lucky Dragon" was exposed by the fallout caused by the thermonuclear test conducted by the United States at Bikini Atoll Marshall Islands. On September 23, 1954, Aikichi Kuboyama, the chief radio operator of the Lucky Dragon passed away. The autopsy of Kuboyama was conducted at first national hospital of Tokyo, Japan from 23:30 on September 23. James L. Hansen, Lt Colonel MC, Deputy Commanding Officer observed the autopsy and shipped the specimen to the Armed Forces Institute of Pathology(AFIP) by request of Elbert DeCoursey, Director of AFIP. Since for AFIP, the case of Kuboyama was very important data to analyze the result of fallout caused by the nuclear test, the specimen was preserved secretly together with the specimens of A-bomb victims in Hiroshima and Nagasaki. The cause of Kuboyama's death has been controversial matter since that time. Medical doctors who treated Mr. Kuboyama attributed the cause of death to irradiation by the nuclear test. Seiichi Ohashi, M.D., Director of the Pathological Department, Tokyo First National Hospital stated in his pathological report, since Kuboyama received, in addition to external radiation, internal radiation exposure, it is highly possible his liver cirrhosis was due to radiation. Scientists who belong to U. S. Atomic Energy Commission and U.S. Military attributed the cause of death to transfusion hepatitis. Hansen stated "I believe it is high unlikely that hepatic lesion could have been caused by irradiation alone or that irradiation was the major factor in the hepatic lesion". On the other hand, for U.S. Military, the case of Mr. Kuboyama was

very important not only to deny the fatal influence of fallout by nuclear test, but also as "nuclear test data". In the letter to Hansen on June 6, 1955, DeCarthy said "this case represents a remarkable contribution to the radiation material of Armed Forces Institute of Pathology. Any further data will be most welcome". This report discusses how and why the specimen of Kuboyama was shipped to AFIP in the context of the Cold War and U.S.- Japan relations, and analyzes perception gap among scientists on the cause of death of Aikichi Kuboyama and fallout caused by nuclear test.

Research by Default: The ABCC Studies on Human Genetics and Fertility. *Aiko Takeuchi-Demirci, Brown University*

The Atomic Bomb Casualty Commission (ABCC) was established in March 1947 by the U.S. National Academy of Sciences (NAS), funded by the Atomic Energy Commission (AEC). One chief focus of their early clinical studies was to examine the genetic effects of radiation on the offspring of atomic bomb survivors in Japan. The genetic studies, however, did not yield any proof of major genetic mutation or deleterious effects, and were terminated in 1954. Another related project that investigated the sterility of survivors also concluded that there was no major problem resulting from the bomb. This paper analyzes how American and Japanese scientists interpreted these "negative" or "inconclusive" results, and used them—by default—in the development of biomedical research in the 1950s. I argue that the ABCC's reproductive studies, both directly and indirectly, served to consolidate the scientific legitimacy and leadership status of American biomedical research. The genetics and fertility studies sought to examine the mutational effects of radiation on human reproduction by studying circumstantial factors such as the incidence of malformations, stillbirths, spontaneous abortions, lower birth weights, neonatal death rate, and the sex ratio of newborns. To gather data, the ABCC scientists depended on the cooperation of local physicians and midwives, who would visit the homes of pregnant survivors and report the pregnancy outcomes to the ABCC. Because of the sensitivity surrounding the issue, however, the "reporting system" was less than satisfactory. In fact, the ABCC did not expect to obtain any groundbreaking results within the limited time, money, and staff—and under various political pressures. Yet the data obtained from Japanese scientists and the access to human "subjects" provided the American scientists with a rare opportunity for other research projects related to human reproductive issues. Examples of these "experiments," which had only slight—if any—connection to radiation research, included studies on consanguinity (population genetics), gynecological diseases, and contraceptive research. The paper thus traces the shift in research direction from their initial proposals to the actual studies and results presented later in scientific publications. It analyzes the significance of these studies in the context of postwar U.S. society and their implications to the development of human genetics. Furthermore, by comparing the American ABCC scientists' interpretation of data and their roles with those of their Japanese counterparts, I seek to illuminate the different politics at work surrounding their scientific investigations. Building upon Susan Lindee's and John Beatty's research on the ABCC's early genetic research in the ABCC archives of the NAS, I will also study the books and journal articles written by American ABCC scientists and their Japanese counterparts after the "termination" of genetics/fertility studies. By doing so, I aim to project the broader picture surrounding the ABCC studies and thus illuminate the global aspect of biomedical endeavors, which have often been defined by international politics and the hierarchical relationship of scientists across the world.

Fallout Exposures as Sites of Knowledge Production. The Case of (Post)Soviet Studies in Cancer Epidemiology. *Susanne Bauer, Max Planck Institute for the History of Science*

This paper explores how epidemiologists have investigated local fallout exposures resulting from the Soviet nuclear program. Adding both to the STS literature on nuclear issues and the politics of cancer risk and public health, this paper examines how radiation studies have shaped cancer epidemiology during and after the Cold War. Further, the paper aims at a thick description of the encounters between western "modern epidemiology" and Soviet/Russian of radiation epidemiology, state compensation policies, humanitarian aid, global and local development agendas. Most epidemiological studies conducted in the Soviet Union - on fallout exposures due to nuclear testing in Semipalatinsk, radiation exposures in Southern Urals and after the Chernobyl accident - focused on cancer risks. In the early 1990s, the European Commission, the U.S. and Japan initiated scientific co-operations with the New Independent States of the former Soviet Union. Much of the joint epidemiological research that followed was pursued not only to document and assess the health effects but also to derive estimates on radiation risk that then translate into global recommendations for radiation protection. Epidemiological risk estimates play an important role in the formation of radiation safety guidelines, e.g. in setting exposure limits for environmental and occupational health. While these guidelines are based mostly on the Life Span Study of atomic bomb survivors of Hiroshima and Nagasaki who were exposed to acute high external doses, radiation epidemiologists strived to complement these high acute dose studies with epidemiological assessments of combined internal and external and chronic exposures. This effort demanded standardization of study designs and methods, in terms of dosimetric data and analytical procedures, which render visible exposure effects within a matrix comparable to the Life Span Study. In the late 20th century, epidemiologists made increasing use of genomic technologies to re-investigate radiation risk in these exposed populations. In addition to refining the precision of risk estimates for different types of radiation, these studies were based on novel biomarkers (e.g. genetic polymorphisms) and aimed at the study of gene-radiation interactions; it was also in this context that, at the turn to the 21st century, radiation epidemiologists perceived the nuclear legacies in the former Soviet Union as unique opportunities for biomedical research.

Discussant:

Susan Lindee, University of Pennsylvania

105. Science and Engineering Education and Nation-State Building in Postcolonial Asia

4:45 to 6:15 pm

5: 532

This session will investigate various trajectories of science and engineering education and their relationship with nation-state building in Asian countries. Postcolonial Asian countries have been the most earnest advocates of science and engineering education. The nation-states of this region promoted science and technology education not only for urgent practical needs of industrial development, but also to fulfill their citizens' aspirations for modernization. Facing Western/developed countries' superb industrial achievements and military power, Asians have considered science and technology as the core for modernization and further committed to develop science and technology since the beginning of 20th century. Postcolonial nation-states in this region, established and led by elites aspiring to science and technology, have enthusiastically invested in science and engineering education. In contrast with the common aspiration to S&T in this region, there has been a great diversity in political initiatives and public responses in among nation-states, depending on their available rhetorical or material resources. This session aims to illuminate this diversity with various case studies. Nimesh Chandra and Venni V. Krishna explore the contribution of IITs (Indian Institutes of Technology) in building intellectual capital, knowledge creation and its application. Their paper demonstrates that IITs play a significant role in the Indian education and innovation systems of science and technology, but nevertheless they are nascent yet cautious in capitalizing on their knowledge. Sungjoo Hong examines the formulation of policy for state-led development of science and technology in South Korea in the 1960s. She underlines the leading role of the scientific community, in contrast with previous historical studies that have emphasized the importance of the government leadership or the strong presidency to the growth of science and technology. Honghong Tinn investigates how Taiwanese engineers in the 1960s introduced electronic computing to Taiwan and used the first two

mainframe computers in Taiwan for various development projects, including improving the island's infrastructure and economic planning. Her research shows how a technological system of mainframe computers was formed in Taiwan during this period. Tae-Ho Kim shows how authoritarian and developmentalistic government advertised the nation's technological capability to mobilize people, by exploring the case of the "International Skill Olympics" in South Korea. While Park Chung Hee administration was heavily investing in vocational training and publicized South Korea's excellence in the Skill Olympics, the people's conceptual distinction of skill, technology, and engineering became blurry. Avvari V. Mohan investigates how Malaysia has articulated innovation polices for the development of the ICT sector, through the Multimedia Super Corridor Project. He explores the role of universities and private learning institutes in the context of developing a Greenfield cluster - Cyebrajaya and a mature cluster in Penang. The case studies of this session will contribute to a better understanding of science and technology education and policy in modern Asia. The four different societies analyzed in this session demonstrates that a comparison and an overview of different Asian countries' science and engineering education and policies will help to illustrate the multiple trajectories of science and technology.

Participants:

Whose Initiative? The Role of Scientists in Making Science Policy a State-led Style in 1960s' South Korea. *Sungjoo Hong, Seoul National University*

This paper examines a leading role of the scientific community in the formulation of science policy for state-led development of the national science and technology in 1960s' South Korea, while previous studies have emphasized the government leadership or the strong presidency as a critical success factor to that growth. The state-led style of science policy has imprinted a social image of "government leads and science follows" to the public, even to the present scientific community in South Korea. During 1960s, however, the Korean scientific community was a key player, not a passive follower in designing the structure to promote the national science and technology, focusing on the establishment of a strong administrative system for science. This paper will explore the leadership of Korean scientists in the formation of science policy with following questions: in which historical background and context Korean scientists forged a state-led way of governing scientific activities and, how the relationship between scientists and the government was, and finally what scientists gained and lost after the encounter with the state.

Building a Technological System of Mainframe Computers in Taiwan, 1960-1965. *Honghong Tinn, Cornell University*

This paper explores the formation of a new technological system of the first two mainframe computers in Taiwan during the early 1960s. Through an UN technical-aid program, National Chiao-Tung University (NCTU) leased Taiwan's first two mainframe computers, an IBM 650 and 1620, in 1962 and 1964, respectively. This paper illustrates how the social meanings of electronic computing were defined in Taiwan during the Cold War. NCTU, with its pioneering electronic-computing courses, was the hub for engineers all over Taiwan to learn how to program computers during this period. Scientists and engineers from various state-owned enterprises and government agencies had to go to NCTU to use the only two available computers in Taiwan. In addition to scientific calculation, the two mainframe computers were used for improving the island's infrastructure and for economic planning. In this paper, the specific questions I plan to examine concern (1) how NCTU programming courses recruited students and how courses were taught, (2) how engineers from various organizations learned to use the computers, (3) what the social meanings of electronic computing were and how they emerged, and (4) how the deployment of mainframe computers was related to the Kuomintang's (or the Nationalist Party) political governance and to the widely spread development discourse or theories. Furthermore, this paper aims to understand to what extent Taiwanese engineers contributed to the expansion of the technological system. Beginning in the late 1950s, both Taiwanese technocrats and engineers believed that introducing Taiwan to cutting-edge expertise on electronics and digital computers would strengthen the development of an industrial sector, such as an electronics industry, in Taiwan, which had a chiefly agricultural economy at that time. Not having participated in early computer innovations during the Cold War, technocrats and engineers successfully applied for UN funds to help NCTU lease Taiwan's first two mainframe computers. In this manner, the technocrats and engineers prompted the beginning of electronic computing in engineering education in Taiwan. Rather than focusing on computing-technology innovations derived from the United States and Europe, this paper addresses Taiwanese engineers' deliberate importing of computing technology. This paper enriches the underexplored early history of electronic computing in East Asia. By investigating the history of the two mainframe computers, this paper helps to explain the circulation of computing technology at the international level during the Cold War. The proliferating practices of computing in Taiwan will be contextualized with the emergence of postwar developing states in East Asia and the politics of international containment during the Cold War.

Incubating "Industrial Warriors": "International Skill Olympics" and Promotion of Vocational Education in South Korea in the 1970s. *Tae-Ho Kim, National University of Singapore*

"International Vocational Training Competition" originated in Spain in 1947 to encourage young people's vocational skill training. Soon it grew to an international event, not only for European countries, but also for East Asia, which was experiencing rapid industrialization. South Korean government noticed it as a useful agent for enhancing vocational training and legitimizing its export-oriented economic policy, which was based on cheap but skilled labor. With the interest and support from political leaders, South Korean government held domestic vocational training competitions to select and train group of technicians to join the international competition. As the tryout and training procedures were so similar to the ones for the Olympic Games, it is not surprising that the international competition was soon called as "Technicians' Olympics" in South Korea. Korean mass media headlined how the young participants had overcome poverty and misfortune with their own skills, and the public identified those stories with their own, and sometimes with that of the nation itself. Eventually, South Korea could have maintained its unrivaled excellence in the comperition since 1977. Despite their outstanding performance, however, the "gold medalists" technicians could not earn proper reward. They received enthusiastic welcome, including car parades and medals, in the late 1970s, but South Korea became less dependent on them as its economy had evolved into higher level, based on heavy industries. And people's images on "technique" or "technology" were also changed into more science-oriented ones.

Chair:

Venni Venkata Krishna, Asia Research Institute, National University of Singapore

106. Empowering Citizens and Scientists to engage in Deliberative Dialogue, Community-based Research and Technology Assessment 3.0

4:45 to 6:15 pm

5: 533

In this session, we present interim reports of our research project "Deliberation and Collaboration between Citizens and Scientists (DeCoCiS)", funded by the Research Institute of Science and Technology for Society in the Japan Science and Technology Agency, especially focusing on the progress of social experiment of a new technology assessment method: "integrated participatory technology assessment (IpTA)". Since the beginning of last decade, how to enhance public engagement in science and technology has been a big challenge in Japan as well as in other industrial countries. As the great prospects of new emergent technologies, such as nanotechnologies and regenerative medicine, have been taking shapes, the concerns over their adverse effects on society, humans and wild nature have been growing explicitly and implicitly. In order to address these emergent issues as well as problems

caused by pre-existing uses of science and technology, various practices and studies of public engagement have been conducted. DeCoCiS is one of those attempts in Japanese context. The objective of DeCoCiS is to establish an "interface organization" on the basis of the Osaka University Science Shop, which started in April 2007, and build its business model to be adopted in other universities so as to enhance public engagement in science and technology by providing society with three services below: 1. To support public dialogue in relation to science and technology among various actors and sectors such as general public, civil society organizations, researchers, policy makers, industries; 2. to enhance collaboration between experts and citizens through the community-based research; and 3. to carry out "integrated participatory technology assessment (IpTA)" that is based on the symmetrical participation of the lay publics and experts (including not only academic researchers but also experts in policy, industry and civil society organizations) and on the combination of dialogues and research based on the needs and concerns expressed by participants. In order to perform these services, since October 2007 we have been studying and developing new methods of deliberative dialogue, management know-how of community-based research conducted by students, the ways to empower scientists to participate in public engagement, and the design of IpTA. Our session presents papers to report current progresses of our project, especially in relation to the social experiment of IpTA on regenerative medicine, the purpose of which is to propose an agenda to be discussed by relevant actors/sectors in society. Our results are expected to contribute to improving our abilities of public engagement in science and technology by strengthening dialogue and collaboration among citizens and experts. The first paper provides a brief account of the whole pictures of the DeCoCiS project and the exercise of IpTA that will start in April 2010. The second paper presents the interim evaluation of the conduct of IpTA. The third paper reports research findings in relation to the barriers that hinder the participation of experts in public engagement. And the last paper managerial strategy of science shop in Japanese context, based on our experience of running Osaka University Science Shop.

Participants:

Outline of the Project "Deliberation and Collaboration between Citizens and Scientists (DeCoCiS)": An Introduction to the Session. *Hideyuki Hirakawa, Osaka University Center for the Study of Communication-Design*

As the introduction to the session, this paper shows the outline of our research project DeCoCiS (Deliberation and Collaboration between Citizens and Scientists), especially focusing on the plan of pilot operation of "integrated participatory technology assessment (IpTA)" in 2010 and 2011. Since October 2007 we have been doing research and development to establish an "interface organization" on the basis of the Osaka University Science Shop, which started in April 2007, and build its business model to be adopted in other universities so as to enhance public engagement in science and technology by providing society with three services below: 1. To support public dialogue in relation to science and technology among various actors and sectors such as general public, civil society organizations, researchers, policy makers, industries; 2. to enhance collaboration between experts and citizens through the community-based research; and 3. to carry out "integrated participatory technology assessment (IpTA)" that is based on the symmetrical participation of the lay publics and experts (including not only academic researchers but also experts in policy, industry and civil society organizations) and on the combination of dialogues and research based on the needs and concerns expressed by participants. In order to perform these services, we have been studying and developing new methods of deliberative dialogue, management of community-based research conducted by students, the ways to empower scientists to participate in public engagement, and the design of IpTA. In 2010 and 2011, we are going to carry out trial of IpTA, choosing the regenerative medicine as its subject. The objective and features of IpTA are as follows. First, its objective is to propose an agenda to be argued by relevant actors in society, for example, in the case of regenerative medicine, researchers in bio-medical sciences and ethics, policy makers, industry, patient groups, general publics. Second, in relation to the features, IpTA is called "integrated" in the sense that it integrates the inputs both from experts and form non-experts symmetrically. In traditional participatory technology assessment the questions are to be made by lay publics and the role of experts is to provide answers to them. But in our IpTA, experts also take a role of making questions which they want to ask non-experts or experts in other disciplines such as ethics and law. As its effect, we expect that the result (agenda) will be more practical and adopted by relevant stakeholders such as scientists and policy makers when they draw up new research plans or policy guidelines. Finally, IpTA is also called "integrated" because it combines dialogues and research in the way that research is carried out in order to find answers to questions and concerns raised by participants in dialogue meetings so that they can understand and argue the issue more deeply in subsequent meetings. In our session, the second paper reports the interim results and evaluation of IpTA, while other papers present the findings of studies of the management of community-based research and the empowerment of scientists to participate in public engagement.

Interim Report and Evaluation of the Integrated Participatory Technology Assessment (IpTA). *Chie Nakagawa, Graduate School of Biostudies, Kyoto University*; *Ekou Yagi, Osaka University*; *Kazuto Kato, Kyoto University*; *Yasunori Yamanouchi, Osaka University Center for the Study of Communication-Design*; *Sho KASUGA, The Osaka University Center for the Study of Communication-Design (CSCD)*; *Hideyuki Hirakawa, Osaka University Center for the Study of Communication-Design*

This paper presents an interim report and evaluation of the progress of the experiment of Integrated Participatory Technology Assessment (IpTA) carried out by our research project DeCoCiS (Deliberation and Collaboration between Citizens and Scientists), choosing regenerative medicine as a subject. This experiment aims to evaluate the deliberative methods and the procedure of IpTA and to obtain the management know-how of running it. It will start in April 2010 and end in October in 2010. The objective of IpTA itself is to propose an agenda to be argued by relevant actors in society, based on symmetrical inputs of arguments made by both experts and non-experts. To this end, we designed the procedure of IpTA as follows. The first step is the "Elicitation Stage" to elicit diverse opinions and questions concerning the issue at science-café-like dialogue meetings. These meetings are held in two streams. One is the "citizens café" whose participants are non-experts, while the other is "experts café" whose participants are experts alone. In both streams, meetings are convened for several times with different members. The results of argument and answers to questions raised in each meeting are summarized in cards and input into subsequent meetings so that the latter's participants can argue the issue by taking them into account. The second step is "Categorization Stage" where both groups of citizens and experts separately sort out the points of argument in the elicitation stage into suitable categories. In the third stage, the "Agenda Setting Conference", citizens and experts jointly draw up a final agenda, a list of concrete questions. Finally, this agenda is used in questionnaire survey targeting various social groups, such as lay publics, scientists, policy makers, patient groups and so on. In addition, the agenda is also sent to relevant sectors such as academic societies and the government organizations in charge of policy making in relation to the issue so that they take it in to account when they make research plan, policy and guidelines. In our paper we discuss the interim evaluation of the process of IpTA, especially of the effectiveness of the methods employed in the elicitation stage, in terms of several criteria such as the variety, balance and width of arguments.

How can we facilitate participation of scientists and experts in the dialogue and collaboration with citizens? *Kazuto Kato, Kyoto University*; *Masahiro Kawakami, Center for iPS Research and Application(CiRA), Kyoto University*; *Kentaro*

Matsuda, Graduate School of Biostudies, Kyoto University; *Ryuma Shineha, Kyoto University*; *Aiko Hibino, Japan Society for the Promotion of Science, The University of Tokyo*

One of the important issues for the technology assessment is how to ensure effective participation of scientists and experts such as researchers in the field of ELSI (Ethical, legal and social issues) and policy-makers. We have conducted two kinds of surveys to find out barriers that hinder the participation of those experts. One is an Internet-based questionnaire survey to researchers in life science fields conducted in 2008. In total, 1255 respondents were obtained. We have also carried out semi-structured interviews to about 20 young scientists to examine what kind of barriers exist for them when participating in the Science Café events held by one of the research institutes of Kyoto University, Japan. We have found that the barriers are both at the psychological level and those of infrastructure in scientific community. Because many scientists have never experienced public communication events, many of them feel anxiety about meeting non-scientists. After participation, they feel they have enjoyed talking with a variety of people who they seldom have chances to meet. Even for motivated scientists, there are not enough opportunities for public communication. They cannot find appropriate support in terms of both professional staffs and funding to organize events, either. By paying attend to the above findings, we plan to conduct group discussions and interviews of experts including scientists and experts in the ELSI (Ethical, legal and social issues) in the area of regenerative medicine. The aim is to grasp their needs and concerns about research and clinical application of regenerative medicine particularly in the field of stem cell medicine. The issues raised by the experts will then be incorporated into the agenda of the "integrative participatory technology assessment (IpTA)" conference. They will be used by the conference participants together with the opinions of lay people to set the social agenda for assessing regenerative medicine as emerging science and technology.

Managing Science Shop in Japanese Context: Challenges and Possibilities. *Yasunori Yamanouchi, Osaka University Center for the Study of Communication-Design*; *Masayuki Kosuga, Graduate School of Letters, Osaka University*; *Sho KASUGA, The Osaka University Center for the Study of Communication-Design (CSCD)*

The science shop has developed in Europe and the United States since the 1970s. In recent years, the activity of the science shop spreads widely across Asia and Africa. In Japan, Osaka University Science Shop was established in 2007 as the first university-based science shop in Japan. Osaka University Science Shop takes a role as the social experiment in Japanese context. Its objective is to customize science shop through practice so that it functions in Japanese society. This investigation is useful for making science shop generalizable. We offer interim report of this experiment. This report comprises two parts. In the first part, we sort out challenges that emerged as the results of applying a Euro-American type of science shop to a Japanese university, and discuss the causes of those challenges. In the second part, based on the discussions of the first part, we clarify the desirable roles and functions of science shop in Japan. As the examples of the Japanese style science shop, we show new practices of Osaka University Science Shop. The challenges found out in practice in Osaka University Science Shop were classified into the levels of an individual, a sectors, and society. On the individual level, we point out the problems of the science shop staffs, students, university faculty, and citizen. As a cause of these problems, we focused on public education of science and human resource development in science. On the sector level, we point out the problems of the assessment of the participants of science shop activities and of the network among sectors. As a cause of these problems, we focus on the personnel assessment system and on the culture which hamper cooperation among sectors. On the society level, we point out the problems of the use of scientific evidence and scientific knowledge in Japanese society. As a cause of these problems, we focus on the features of Japanese society in political activity and social decision making. In the second part, we report new practices of the Osaka University science shop as examples of the Japanese style science shop. "The short-term research project" was introduced in Osaka University science shop in order to enhance students' research literacy. In this project students are to carry out research on their own subjects. We have developed managing know-how of student's research through this project. Additionally, Osaka University Science Shop expands the role of science shop by adding the functions of communication support and technology assessment to a conventional role of conducting community-based research.

Chair:

Hideyuki Hirakawa, Osaka University Center for the Study of Communication-Design

FRIDAY, AUGUST, 27

107. Human Enhancement

9:00 to 10:30 am

12: 1212

Participants:

(Re)Figuring the Elite Athlete Doper in the American Doping Debates: A Gendered Technomedical Entity. *Cora Mae Olson, Virginia Tech*

Situated at the intersections of sports studies, science and technology studies and feminist science and technology studies concerned with the body, this work explores the processes and practices that constitute the American doping debates. Building off of Claudia Castañeda's notion of figuration, I recognize these debates as intertwined with the micropolitics of race, gender, and sexuality. This theoretical approach sees the processes of making figures as always already marked by and in tension with beliefs about what it means to be human, what it means to have agency, and how bodies are rendered distinct. These processes exist as sense making practices in multiple complimentary arenas of knowledge. Within the doping debates, the real is contested/constituted by scientists, pharmacologists, law-makers, journalists, and athletes. The struggle for the real is a struggle about what it means to be human. Athletes become the bodily sites of struggle in this definitional process. In my analysis, I assume that athletes(/dopers) simultaneously represent forms of bodily perfection and corrupt(able) bodies. Athletes and doper figures are constructed though multiple material and discursive strategies. How and what (raced, gendered and sexualized) figurations do American doping debates produce and sustain? This particular talk will explore the gender figurations produced and negotiated in blood boosting practices and regulations. Elite endurance athlete dopers use blood boosting technologies such as Erythropoietin (EPO) and continuous erythropoietin receptor activator (CERA) to increase the oxygen carrying capacity of their blood. Is this doping? Through analysis of technomedical and formal policy documents, popular media, and elite athlete interview material, I show how the (always gendered) elite athletic and doper bodies emerges in debates between bureaucratic policy agencies, sports governing bodies, and technomedical (pharmacological) experts. I will emphasize the technomedical practices and knowledge that co-constitute the bodies of elite athlete dopers while acknowledging that the technomedical does not exist completely separate from the policy figurations of elite athlete dopers. The methodology for this work derives from and is informed by feminist STS scholars like Donna Haraway, Emily Martin, Anne Balsamo, and Elizabeth Grosz. I seek to make sense of the intersections (and co-constructions) of particular bodies with biomedicine, technoscientific and regulatory knowledges. By making these

processes of figuration visible, we can begin to imagine new figurations and new policies for the elite athlete/doper. The presentation also offers the American case as a point of comparison with other national and international understandings of blood boosting practices and regulation as well as a point for broader international biomedical policy comparisons.

On Democracy, Citizenship, and the "Obligation" to Participate in Medical Research. *Karen-Sue Taussig, University of Minnesota*

This paper, based on ethnographic fieldwork, examines the politics of participation in medical research. For some time now I have been investigating the social transformations involved in efforts to realize a molecular medical clinic. In particular, I am interested in understanding the ways efforts to close the gap between new molecular knowledge and long promised but not yet realized clinical interventions such as gene therapy, pharmacogenomics, and stem-cell therapies, occur in a space of uncertainty that is a productive site for imagining and building particular futures. The future implicated by these efforts, I argue, is not singular or uncontested. Rather, it is being produced out of debates over changing conceptions of the body and transforming relations among the state, biological research, and citizens as people work to create the material, political, economic, and conceptual means deemed necessary for facilitating the realization of a molecular medical clinic. At the heart of these efforts is a concern to gain access to the material means of contemporary knowledge production in the life sciences—DNA connected to family histories, and medical records. Deep anxieties about gaining access to these materials have led to diverse strategies for involving people in what I call "genetic thinking and practice." Recently a range of actors in this domain in the United States have begun to articulate a desire to frame participation in medical research as an obligation of citizenship. Drawing on ethnographic data, this paper examines the contexts in which this desire is articulated and its broader implications and effects. This paper contributes to STS literature on biopolitics, scientific governance, and science, subjectivity, and citizenship.

The Expanding Embrace of Race in Biomedical Product Development. *Jonathan Kahn, Hamline University*

Ethnic niche marketing is well-established in American product development and advertising. Commercial biotechnology seems to have discovered the potential of such marketing in the case of BiDil, the drug ever approved by the FDA with a race specific indication - to treat heart failure in blacks. This presentation will move beyond BiDil to explore the expanding embrace of race in pharmaceutical development, patenting, and marketing. Big Pharma is plagued with a plethora of "me-too" products. Once one company has developed a particular block-buster drug, whether in pain relief (e.g. Cox-2 inhibiotrs) or cardiovascular health (e.g. statins) other clamber to join the bandwagon by producing biologically similar, yet legally distinct - i.e. non-patent-infringing - pharmaceutical products. With numerous similar products on the market, it becomes essential for each producer to try to distinguish their drug from the crowd. Traditionally, this was done with respect to claims of improved efficacy or lesser side effects. More recently, pharmaceutical and medical device companies have discovered race as a means to distinguish their products (and patents) as well. This presentation will explore this phenomenon by looking a two illustrative cases: one, the beta-blocker, Nebivolol, marketed as Bystolic® by Forest Laboratories; and two, a diagnostic test for genetic variations affecting response to the blood thinning drug warfarin, marketed by the California AutoGenomics. Each case provides insight into a powerful dynamic whereby increased biomedical knowledge, rather than leading to more individualized targeting of biomedical interventions, becomes reframed in terms of racial categories primarily for commercial benefit. This will contribute to STS work on globalization of pharmaceuticals; intersections on race, biology and law; and the commodification of race.

108. Energy, Environment and Policy

9:00 to 10:30 am

12: 1213

Participants:

Explaining Environmental Policies Implementation Gap at Local Levels in China. *RAN RAN, University of Southern California*

China has become the world's largest emitter of greenhouse gasses in 2008. The seriously deteriorated environmental conditions have generated social and political problems in China, which are not only one of the biggest national issues but also a great international concern. A paradoxical problem of Chinese environmental politics is: on the one side, Chinese authorities show great awareness of environmental problems and provide a high-quality framework for pursuing sustainable development by constructing a comprehensive and modern set of environmental policies. However, on the other side, many of the environmental policies have produced outcomes with little concrete effect. This paper defines the difference between the central government's official environmental policies and these policies' practical outcomes at the local levels as the "environmental policy implementation gap", exploring the dynamics of the environmental policy implementation gap at the local levels in China in the context of an authoritarian political system's transformation and struggle to sustain legitimacy? This paper draws on some of the newer literature in systems theory as well as some of the classical early writings to construct a "system analysis model of the environmental policies implementation at local levels in China" as the conceptual framework. The methodology is a qualitative case study, combining interviews, non-participation observations, and documentary analysis. The interviewees include a variety of actors who might influence environmental policy implementation at local levels of China. Three different administrative levels of cities in China have been selected as the cases: Xiamen city of Fujian Province, Southeast China; Shi he zi city of the Xinjiang Uygur Autonomous Region, Northwest China; and the Ying Kou Economic & Technological Development Zone of Liaoning Province, Northeast China. The main arguments are as follows: the environmental policy implementation gap at the local level in China is the result of five interrelated factors: (1) the inherent "fragmented authoritarianism" characteristics of the environmental policy implementation system at local levels in China; (2) the perverse incentive structure of the environmental policy implementation system that constructed by the three contextual factors; (3) the various "input costs and losses" generated in the transportation of policies and demands from the context to the environmental policy implementation system; (4) the implementation system's fragile implementation ability of translate input into outcomes due to the constraints of implementation resources and cognitions; and (5) the dysfunction of internal supervision over environmental policy implementation outcomes within the political system. None of these variables alone is sufficient to explain the dynamics of the environmental policy implementation gap at the local level in China. They are mutually reinforcing, working in concert to produce the varying degrees of the environmental policy implementation gap at the local level in China.

Green Developmental Network States: Science, Technology and Environmentalism in the U.S. and Brazilian Biofuel Sectors. *Abigail N. Martin, University of California at Berkeley*

This paper will present ongoing research for a dissertation project that investigates how state actors construct and govern biofuel technological systems in the U.S. and Brazil. Biofuel technological systems refer to a nation's particular system of development and innovation in which a network of public and private agents, groups and institutions configure various components (i.e. technological artifacts, natural resources, processes, laws) into an industrial sector capable of producing a commodity. To understand the role of the state in building these systems, I employ the concepts of 'developmental network

states', 'green states' and 'sociotechnical imaginaries.' In doing so, I join three fields of social science—science and technology studies (STS), economic sociology, and environmental politics—in order to develop the concept of the 'green developmental network state'. This concept lends itself well to understanding the role of states in the development of energy systems that pose significant environmental risks on society. At both the domestic and transnational levels, the hazards of biofuel technological systems have been highlighted and debated by various groups, ranging from professional environmental organizations to radical grassroots social movements to intergovernmental institutions such as the United Nations and the Organisation for Economic Co-operation and Development—all of which are involved in the discussion and design of 'international sustainability certification' for biofuel production and distribution processes. In this climate, Brazil and the U.S.--the two largest producers of biofuels--have increasingly confronted concerns emanating from the public sphere about the 'sustainability' of biofuel production and use. As both states work to address risk alongside economic development priorities, they present unique opportunities to refine and validate the notion of the 'green developmental network state', as well as provide insight into why and how states support particular trajectories of science and technology for new energy systems. This research uses the qualitative case study method to examine three arguments: (1) Brazil and the U.S. function as 'developmental network states' (DNS): they support the biofuel industry by developing science and technology (S&T) policy that allows the state to work closely with technologists and firms in collaborative networks; (2) In both countries, S&T policy for biofuels initiates ecological modernization processes in which the burgeoning 'green state' must address the concomitant risks of biofuels development. Just as the officials in the DNS are deeply rooted in a network of technologists and businesses, officials in the green state are embedded in a multi-level network of technological polities; and, (3) Identifying the sociotechnical imaginaries of green developmental network states, and the knowledge regimes in which those imaginaries are nested, is crucial for understanding why and how S&T policies for biofuels come to reflect nationally specific conceptions of public 'goods' and 'bads'. In developing these arguments, this research aims to contribute to discussions on how particular state-society relations can direct R&D dollars more democratically, such that technological innovation and developmental initiatives address pressing societal problems.

Performing Sustainability: Following Carbon at a Site of Emission Reduction. *Anup Sam Ninan, Bremen International Graduate School of Social Sciences*

The mainstream climate regime under the United Nations Framework Convention on Climate Change (UNFCCC) operationally comprises of diverse forms of metrological integration what Andrew Barry calls as 'technological zones' (Barry 2006). Different forms of localised material translations that are inherent in the functioning of technological zones also provides an overt coherence to the regime. Thus, carbon for instance, is a scientific object, a group of greenhouse gases, a medium of exchange, and a currency at different locations of the climate change regime while remain as an empty signifier over all. The location specific translations and performances, on the one hand, integrate the regime to a heterogeneous network of interrelations. At the same time, the performance at a location can be self-containing by its own boundaries with location specific performative sociomaterial practices. Sometimes, both these performances can be conflicting as in the case of 'sustainability' - being performed in the knowledge making location (IPCC) in comparison to the market mechanism that are aimed to fulfill these objectives (eg. the location of a Clean Development Mechanism (CDM) in a developing country). Based on an ethnographic fieldwork done in two CDM projects in India, the current paper explores the spatial and performative negotiations of climate politics. It looks into the everyday performance of the making of carbon credits. It also probes how the offset projects negotiate sustainability spatially, on how its locally bound performances are (made) compatible with the other performative domains of the different locations of the network. Looked at from an Actor-Network Theory (ANT) perspective, the paper draws substantially from the discourses of sustainability. Discussions on spatial relations, environmental justice, institutional functioning, north-south relations, market mechanisms for climate change mitigation, technologies of translation etc. across disciplines ranging from political geography, political ecology, organisation studies, accounting, international relations to environmental studies foreground the ethnographic observations of the performance of CDM projects. Theoretically, the paper goes in line with the current works that problematize the 'social' as the assemblage of heterogeneous material relations, and as an empirical case, takes up the call of Donald Mackenzie (2009) to 'witness' the carbon trade from its sites of emission reduction. References: Barry, Andrew (2006) Technological Zones. European Journal of Social Theory, 9(2): 239-253. MacKenzie, Donald (2009) Making things the same: Gases, emissions rights and the politics of carbon markets, Accounting, Organizations and Society 34 (3-4) (2009), pp. 440-455

Planning for innovation: How scientists envisage commercialization of their research. *Marie Komissar, Norwegian University of Science and Technology*

Norwegian energy policy is clearly influenced by what we can call post carbon strategies, a term used to highlight the short- and mid-term need to curb CO2 emissions and the long-term need to replace oil and gas with new renewable energy sources. This involves many challenges. From a STS perspective, one of the main challenges is the appropriation of technology by society. The appropriation involves public and private stakeholders in the energy sector, but is also dependent on the acceptance and appropriation of the technology by the general public, which have their own views and interests with respect to adapting, understanding and accepting new knowledge and new technologies. One can say that the extent to which the public domesticates both the technologies and the knowledge produced by science on the climate changes has importance for the outcome of innovation processes related to post carbon developments. Several technologies are under development by research communities in many countries, with outspoken political expectations that the scientists' efforts fairly quickly will be translated into innovations that may be broadly implemented. How do the scientists themselves perceive such innovation processes? Do they think from a kind of linear model, seeing innovation as driven by research? Or do they see innovation as mainly the responsibility of industrial partners? How do they perceive the sociotechnical challenges related to making innovation? What emphasis do they place on the role of the general public and its way of engaging with new technologies? The paper will discuss these questions, based on qualitative interviews with technologists from two large centers of research on environmental energy funded through a goal-oriented research initiative from the Norwegian parliament. More specifically, the paper will explore how the involved scientists anticipate the innovation process of two technologies: Offshore wind-power and Carbon Capture and Storage (CCS). Particular emphasis will be put on analyzing the scientists view on the general public's importance for innovation and implementation. How is the public expected to react? Are the scientists prepared to engage with the public as part of their research and innovation strategies?

Study on the Framework of Diffusion of Innovation with the Negotiation Under UNFCCC. *Mai MURAYAMA, University of Tokyo*

This paper discusses about innovation and technology transfer matters, mainly in the context of the negotiation of technology transfer on the UN Framework Convention on Climate Change (UNFCCC). The conflict between developed and developing countries about technology transfer in UNFCCC comparing with the preexisting issues was structured (Murayama, 2010). This

paper focuses on the framework of the diffusion of innovations (Rogers, 1983). The purpose of this paper is to clarify the negotiation points under UNFCCC in the context of the diffusion of innovations. In the text of UNFCCC treaty, the promotion and transfer of environmentally sound technologies from developed countries to developing countries is noticed. The implementation of technology transfer framework which is discussed under UNFCCC is to mitigate and adapt climate change while the technology transfer is an economic development issues. Developing countries have demanded to address the issues related to intellectual property rights, there are no agreements. Neither, there is any agreement for the fund. The submission texts from parties to UNFCCC bureau and the decision papers of UNFCCC are used to analyze them. From these texts that are pointed out each different institution, the views of each parties and each theme were made extract to classify the views of countries. These extract points were categorized by the topic into general ideas, format and tasks. It is applied the framework of diffusion of innovation to these classifications and categorizations, which are structured the cognitions of developed and developing countries. As the technology transfer occurs through the market based in the product innovation period of which is in price competition (W.J.Abernathy, 1978), it is same with the technology for climate change. Process innovation promotes the mitigation of climate change. It is difficult to make a home-manufacturing in developing countries, which is their needs, because through the foreign direct investment, the subsidiaries in developing countries are taken by the multinational companies originated in developed countries. The upgrading of technological needs assessment, technological information, etc. have been advanced under UNFCCC for the differences of the information in non-market based channel between developed and developing countries. It has been started to review the regulatory and legislative frameworks and the institutional systems to identify the challenges faced and the remaining gaps from the implementation of technology transfer under UNFCCC. The phenomena of diffusion of innovation occurs in the field, however to make sure to diffuse the environmentally sound technologies, it has to be negotiated. Study on the negotiation about these kinds of topics, it is contributed to STS in the context of study on international decision making.

TheTechnology and Values of The Low-carbon Development.
zhao jianjun, The Party School of Committee of CPC Philosophy Department

Global Warming is threatening the sustainable development of human culture. How to develop the human culture and deal with the global warming is become the most difficult and urgent problem. The tendency of global low-carbon economy The low-carbon economy is a new economy development model which means low energy consumption low carbon emission and low pollution. People agree that developing the low-carbon economy and lifestyle instead of the traditional development mode is the way for the sustainable development of the world. The Chinese government pay more attention to the low-carbon economy.The Chinese government promised that the percentage of greenhouse gas emission reduction of China which is based on the date of 2005 is form 40% to 45% on the 25th november 2009.The percent of the consumption of the non-fossil energy source in the primary energy sources consumption is about 15%.
The technology selection for the low-carbon development
The technology is the key of the development of low-carbon economy. The low-carbon technology can be divided into three kinds. 1.Carbon reduction technology 2.Non-carbon technology 3.Carbon elimination technology The low-carbon technology will cause the change of the way of energy utilization.
Low-carbon culture values The low-carbon economy is the global revolution of production mode lifestyle values and national interests. If we do not change the high-carbon characters of industry civilization, we will not make the sustainable development. In order to development the low-carbon economy, everyone should try his best and change the values.

109. Innovation, Governance and Policy

9:00 to 10:30 am
12: 1214

Participants:

Towards a bipolar society? The changed function of scientific expertise in our time. *Ole Andreas Brekke, Uni Research, Stein Rokkan Centre for Social Studies, Bergen, Norway; Roar Høstaker, Lillehammer University College, Norway*

This paper takes as its point of departure the thesis introduced by Gilles Deleuze two decades ago, that the socio-political logic of modern societies are shifting from a discplinary logic to a logic of control. Although widely quoted, not least within the STS literature, there have been few attempts at developing this thesis further. There has been a tendency to either restrict it to denote the proliferation of surveillance technologies, as synonymous to a surveillance society or to apply it broadly to describe the transformation of Western societies towards a cognitive capitalism. In contrast, we argue that the notion of a society of control offers a rudimentary analysis of an evolving new socio-political logic in our societies, the main product of which seems to be a process of conflation in both time - a de-temporalization of the difference between present and future - , and social levels - a short-circuiting between individuals and a macro level. In this transformation the role of the middle level of state-institutions, professions and science is changing. This middle level was in many ways the formative force of disciplinary societies, according to Foucault, as institutions formed enclosed environments, molded the individual in different life-phases, and professions claimed authority over the individual based upon esoteric scientific knowledge. In the emerging society of control, the strongholds of this middle level are circumscribed by demands of transparency, accountability and legal responsibility. When institutions become more open for external control the esoteric knowledge they are based on is disenchanted, and their role as intermediaries between government and population is weakened. When professional expertise no longer can subordinate social fears and hopes to their own logic of research and development, these fears and hopes emerge as much more immediate and directly transmitted between the individual and society at large. One important example is the great expectations of future breakthroughs in the life sciences, which has escalated into a discourse of hope promoted both by scientists and affected patient-groups. Increasingly, established principles and norms of scientific research are being ignored or pushed aside, by the exceptional force of future expectations. Biomedicine is, however, not the only area where exceptional measures are involved. Fear of pandemic illnesses opens up all sorts of emergency measures. Simultaneously, some of the most pressing political issues in our time like global warming, fear of nuclear disaster and international terrorism lack any obvious institutional solutions. The political discourse in these fields invite the opposite of hope: a general condition of despair. This leads to a paradoxical blend of both demands for immediate action and total paralysis in face of a future which is at the same time portrayed as both grim and full of possibilities. In the paper we shall investigate further the dynamics of this change, arguing that the emerging societies of control increasingly carry the marks of a bipolar patient: an oscillation between unwarranted optimism and despair.

Science and Technology Governance: Modes and Policy Instruments——From Domestic and Global Perspectives.
Jing jing Zeng, Huazhong University of Science and Technology University

Abstract: Since the 1990s, the discussion of engaging "governance" in scientific and technological policies has become fashionable in contemporary public administration. While different scholars have different opinions about science and technology governance (ST Governance), most of them admit that ST governance is an expansion of governance theory that

applies in the fields of science and technology. The practices from around the world in recent years indicate that the clamor for ST Governance is rising because of the "external" and "non-bordered" nature of the scientific and technological activities which have brought great challenges of independents, incorporations and competitions for all levels of governments. There are ongoing ST policy changes taking place in global, domestic, regional and local levels; however, buzz-words used to describe this trend----"Collaborative governance", "Intergovernmental Governance", " Holistic Government", "Joined-up policy"----are regarded with criticism. Guided by the viewpoint of Pragmatism, this paper presents the basic meaning of ST Governance, the causes of its emergence and its contents. The paper then analyses the domestic and transnational ST policies, using these policies as a basis to propose four types of ST Governance modes, namely "transnational bilateral or multilateral ST Governance", "central and local governmental vertical ST Governance", "regional horizontal ST Governance" and "polycentric network ST Governance." By combining governance tools with ST Governance modes, three types of ST Governance tools are put forward, namely "Structural control instruments," "Contract inducement instruments" and "interactive influence instruments." Finally, author attempts to reveal the trends of development of ST Governance instruments based on global and domestic backgrounds. The author builds on these practices and literatures to answer the following questions: (1) what does ST Governance mean, and what is its connotation? (2) What are the modes for ST Governance? (3) What are the current governance tools for ST Governance and how do these tools work? (4) From domestic and global perspectives respectively, are there any distinctions or similarities of these ST Governance tools and its trends of development?

Scenario Making and Roadmap for Better Industrial Systems in 2020 -- A Regional Study in China. *Keishiro Hara, Osaka University*

Due to their rapid industrialization and urbanization, Asian nations, such as China, are facing environmental degradation, resource overconsumption and various socioeconomic problems. It is, therefore, critically important for these nations to change their course of development. Scenario approaches based on understanding of the dynamics of human-environment interlinks are an effective tool to help us envision sustainable future societies and pursue better decision making. In this paper, we apply the scenario approach to a case study in Shanghai and the neighboring province of Jiangsu in China, particularly looking into industrial systems of the regions by the year 2020. By investigating the current status of energy and resource consumption in the steel and cement industries in the region and exogenous variables such as population, gross domestic product (GDP), and energy efficiency level, we set up four plausible future scenarios for the regions: 1) Business as usual (BAU) scenario, 2) Policy based scenario, 3) Diffusion of highly energy efficient technologies in industries, and 4) Circular Economy and Industrial symbiosis. Based upon the envisioned scenarios, we argue what type of technologies and policies (roadmaps) should be pursued to promote sustainable industrial systems in the region in 2020. We highlight that the scenario approach effectively demonstrates possible pathways and provides an opportunity to identify strategies (e.g. technologies and policies needed) towards energy-efficient industrial societies in Shanghai and Jiangsu province.

110. I beg to differ - pertinent disagreements for 4S

9:00 to 10:30 am

12: 1222

I really must disagree with And here's why: I beg to differ - pertinent disagreements for 4S Some of the most important contributions to the STS literature has sprung out of poignant debates within the STS community. Somehow an epistemic affinity between debating parties has facilitated the manufacture of criticisms that forward both sides of the argument and hence the field of STS as a whole. This track is aimed follow this tradition by housing informed academic dispute within STS. Instead of using the stock track orderings based on an empirical field, a societal concern, a theory or a method, this track is ordered to celebrate debate. We invite contributions that wants to further STS by taking explicit issue with something revered within STS. Our aim is to also house quick responses within the track and would therefore appreciate if contributions contained a notification of possible candidates for delivering a response. Track organizers Claes-Fredrik Helgesson, Linköping University Brian Rappert, University of Exeter Contributions: Jochen Gläser, Center for Technology and Society, TU Berlin. E-mail: Jochen.Glaser@ztg.tu-berlin.de "The scientific community is dead. Long live the scientific community" Claes-Fredrik Helgesson, Department of Thematic Studies - Technology and Social Change, Linköping University. E-mail: claes-fredrik.helgesson@liu.se "Pertinent economic valuations as the uneasy topic: A critical reflection on the financial markets turn" Geneviève Teil, INRA SADAPT, Paris, France. E-mail: genevieve.teil@agroparistech.fr " Performing « terroir » or a new way of performing « objective » and « non testable » knowledge" Steve Woolgar, Saïd Business School, University of Oxford E-mail: Steve.Woolgar@sbs.ox.ac.uk "'It could be otherwise' in practice"

Participants:

The scientific community is dead. Long live the scientific community. *Jochen Glaser, Technical University Berlin*

The scientific community has disappeared from the conceptual agenda of science studies but has resurfaced in empirical studies in various disguises. In this paper, I argue that it was wrong for the sociology of science to abandon the concept in the first place, and that a reappraisal of scientific communities as sites of knowledge production provides interesting opportunities The scientific community was got 'lost in translation' during the constructivist turn. There are notable exceptions, e.g. the first laboratory study by Latour and Woolgar and the work of Harry Collins. However, the difference between the traditional Mertonian/Kuhnian school and the 'new' constructivist school has been described as the former being a sociology of the scientific community and the latter being a sociology of scientific knowledge. Some scholars even explicitly rejected the idea that 'scientific community' is a relevant concept for the sociology of scientific knowledge. In most cases the departure from studies of scientific communities took the simple form of ignoring social phenomena outside the laboratory under investigation (a consequence of what Knorr-Cetina and Mulkay called 'methodological microscopism'). Apparently, the critique by constructivists of the traditional Mertonian (and Kuhnian) sociology of science implicitly adopted one of the latter's incorrect premises, namely the dichotomy between the local laboratory as the site of the production of scientific knowledge and the global scientific community as the site of communication of that knowledge (and the emergence of accompanying norms). Later on, ANT opposed the distinction between a micro- and a macro-level of analysis. The subsequent re-emergence of collective-level analyses identified the scientific community as the producer of scientific knowledge. However, the original concept appears to remain taboo and is replaced by ad hoc - conceptualizations or less precise notions. Important disguises in which scientific communities have resurfaced in science studies are 'social worlds', 'superorganisms', 'a tribe of collaborators sharing objects of understanding', and 'epistemic cultures'. These conceptualisations acknowledge the idea of a specific collective level at which knowledge constructs relate researchers to each others but use it as a background for discussing commonalities and differences between individual-level epistemic practices rather than studying the emergent phenomena at the collective level. 'Bringing scientific communities back in' offers several advantages to the sociology of science/scientific knowledge. While empirical research could benefit from such a perspective, the conceptual possibilities are even more intriguing. Treating scientific communities as sites of knowledge production that are characterized by a specific social order provides a new perspective on relationships between micro- and macro-levels of knowledge production. A reappraisal of the scientific community as belonging to a specific subtype of community (production communities) introduces a new link to general sociology

(sociology of community, theory of social order) and to the sociology of technology (e.g. the research on open source software communities). However, these links rest on another premise that might be contentious, namely that it is worthwhile to study the production of scientific knowledge in an asymmetric traditional sociological framework.

Pertinent economic valuations as the uneasy topic: A critical reflection on the financial markets turn. *Claes-Fredrik Helgesson, Linköping University*

The turn to the study of markets, and in particular financial markets within STS has provided many new insights. It has, for instance, provided insights into the role of theories in shaping calculative practices (rather than representing them), the import of market devices, and the precarious shaping of economic agencies. This emerging programme has provided both an epistemological and a reflexive challenge with a capacity to invigorate other parts of the social sciences taking an interest in economic practices and economic ordering. This paper acknowledges the many important insights produced in the growing body of work labelled social studies of finance. Yet, the paper takes issue with the idea that the field of finance is the prime site for studying economic orderings and economic valuations. Within its traditional domains of research, STS has been relatively void of contributions taking economic orderings and economic valuations as topics for investigation. The emergence of the financial markets turn could in this sense be seen as an appropriate response to a long-standing neglect within STS. Yet I argue in this paper that the turn to finance as a domain, and the spinning off of the financial markets turn into a partially separated field, further underlines the traditional neglect within STS to examine the import of economic practices within the domains of science and technology. Indeed, there are some important similarities between ignoring the economic and putting it to the foreground as is done in the financial market turn: Both performs a notion of the economic as in principle separable from other, more entwined, aspects. The pertinent question that this paper raises is this: Why is it so difficult to topicalise the economic practices and why did it come into such rich fruition once a new domain, finance, was appropriated? Attempting to answer this question might provide new topics for disagreement as well as for research.

Performing « terroir » or a new way of performing « objective » and « non testable » knowledge. *Genevieve Teil, INRA SAD APT*

Not only do scientists make objects matter, act and resist in the world. Simple producers as wine producers do it too. However, they do not resort on laboratories, or research and metrology networks. How do they achieve such a performance? Our communication explores this issue by examining the controversy surrounding the wine quality sign AOC, a French quality label based on "terroirs"- terroirs being a collective understanding of wine quality based on nature and culture interactions. Terroir advocate wine-growers are calling into question the AOC capacity to differentiate between qualities; they highlight the "drift" in standard of the AOC label and contest its capacity to clearly differentiate the terroir quality of the AOC wines. They are therefore asking for a reform of the AOC quality sign in order to make it more discriminating. The administration has answered by asking the producers to provide for guarantees of the presence of terroir, and namely criteria allowing for a terroir test. Scientists have tried to isolate an "authentic" terroir quality, but without success. Other attempts to define terroir and its gustatory qualities were equally vain. As a consequence, the same scientists often contest the validity of these notions and the claims put forward by the label users; and the impossibility of supplying identification tests for terroir quality fuels their doubts. In their point of view, terroir is nothing more than a pure "social construction", that is, a void illusion, a competition barrier or a support for social stratification. Therefore, the reform the producers ask for is in stand by. But why cannot scientists provide for a test of terroir? Those scientists would answer: "because terroir does not have any 'real' referent". We venture a different interpretation by showing that the wine producers have come up with a particular procedure to make terroir matter, distinct from the classic scientific way. They do not proceed through the "objectivation" of a "thing" called terroir. They recur to a collective critique-framed procedure, which spreads the terroir over a myriad of judges who try to appreciate it. Therefore, its definition and interpretation are definitively distributed, which makes one of the basic scientific proofs, the test, useless: it is impossible to build a test involving only a limited amount of "representative" people in a "representative" place at a "representative" moment in time. This other production of knowledge, which is comparable to "hot" science, that is the knowledge-in-the-making, in turn, requires to invent a different way to test and guarantee "things". This implies for STS to go further into the description of the "state of being" of these objects, which, the article argues, is not merely a question of "construction" of the knowledge, but of its ontology and the hypotheses we make about representation.

Chairs:

Claes-Fredrik Helgesson, Linköping University
Brian R Rappert, University of Exeter

111. Research Methods and Research

9:00 to 10:30 am
12: 1232

Participants:

The Challenge and Promise of Survey Research in Science Studies. *Timothy L. O'Brien, Indiana University*

Contemporary research in science studies has shown a penchant for qualitative methods. Recently, however, survey researchers have attempted to develop standardized measures of some of science's intensely interactional facets. Several surveys have incorporated theoretical frameworks developed by qualitative studies, but difficulties persist in reconciling these seemingly divergent methods. The first section of this paper discusses challenges and promises of using survey techniques to compliment and extend qualitative science studies. Although standardizing aspects of science may cost analysts depth of understanding, survey techniques make possible greater breadth of knowledge. First, survey research allows investigators to establish the presence or absence of social patterns and trends identified or implied by qualitative researchers. Second, survey research makes available a broader range of audiences for study. These techniques therefore allow analysts to compare how various groups interpret and employ science. The second section of this paper discusses how two specific survey techniques, vignettes and open-ended questions, can be used to minimize costs and maximize benefits described in the first section of this paper. Vignette descriptions provide respondents greater contextual information than is typically provided in questionnaire-based research. As such, vignettes, especially experimentally-designed ones (i.e., vignette descriptions that vary systematically across respondents) are particularly well suited for detecting ways in which situational and personal characteristics pattern interpretations of science at the social level. Also, open-ended questions provide the advantage of capturing respondents' language, therefore providing better opportunity to capture respondents' meaning. Qualitative analyses can then be used in conjunction with statistical techniques in order to present more interpretative understandings of broad social patterns. This paper concludes by discussing two recent survey studies of scientific authority that have used vignettes and open-ended responses to advance understanding of concepts identified by qualitative scholarship. In the first example, I describe my analyses of a nationally representative data set that used vignette descriptions to examine public perceptions of scientific authority in the context of several policy issues (e.g., climate change, stem cell research, and genetically modified food). The analyses identified surprising education differences in scientists' authority over policy decisions. The second example I describe is a survey

of university students conducted by the author in 2008. The study combined experimentally designed vignettes and open-ended questions to examine how scientists' personal engagement with social problems influenced their authority over related public policy decisions. In this case, statistical analyses of fixed-response data were supplemented with qualitative analyses of open-ended responses. Each of these surveys are discussed in terms of their ability to extend qualitative science studies.

Disciplinary Identity Crisis: Different Modes of (Inter-)disciplinarity. *Gaston Heimeriks, Innovation Studies, Utrecht University*

The notion of interdisciplinarity has received a lot of attention from researchers and policy makers in discussions around the social and intellectual organisation of the sciences. A recurring theme in these discussions relates to the different meanings of the concept of interdisciplinarity. In this paper we propose a conceptualization of different forms of (inter-) disciplinarity by introducing different levels of analysis; research, science and society. Science can be considered a complex adaptive system with interacting researchers giving rise to an emergent scientific body of knowledge. This system is functioning within a wider societal environment that provides resources and disturbances. This conceptualization allows us to elaborate the changes taking place in the sciences with respect to disciplinary identity formation and to discuss how different modes of interdisciplinary research are emerging. In this conceptualisation, researchers are the nodes that carry the science system. Research can be considered as geographically situated practices with site-specific skills, equipments, tools and practices. At this level, interdisciplinarity relates to the variety of skills and infrastructures that are required for collaborations of formulating research designs, applying methodologies, using tools and data gathering in knowledge production. On this level of analysis, disciplinary identity is reproduced through local research traditions and the institutional organisation of teaching and research. The science level refers to the formal communication activities in science; the scientific end-products published in journals and books, and announced in conferences. Publications are not evenly distributed but form emerging clusters of related publications in an otherwise empty landscape. At this level, disciplinarity relates to the position of a publication in this changing landscape of distributed scientific contributions. Here, disciplinarity is reproduced through journals, their citation patterns and professional organisations. The contextual dynamics refer to the ways in which knowledge production provides resources for social and economic development and the ways in which society provides resources and disturbances to sciences. At this level, interdisciplinarity relates to the intensity of knowledge use in society and the importance and variety of stakeholder involvement. In this paper, we will provide empirical examples of these different modes of disciplinarity. It is important to distinguish between these levels of analysis because different modes of interdisciplinarity refer to different processes and are not necessarily occurring simultaneously. For example, a field may be characterised by a strong and stable disciplinary identity in terms of publication patterns, while a combination of different skills, infrastrucures and tools is used in research practices. Furthermore, these different levels of disciplinarity are subject to change. From this conceptualization it follows that interdisciplinarity is not an intrinsic property of knowledge (e.g. how, why), but is a relative property in relation to activities in research (collaboration between researchers with different skills), to the position in a body of literature in science (publication patterns), and the type and intensity of societal interactions (user interaction and stakeholder involvement).

Issues in researching citizen science projects. *Bipana Bantawa, University of Oxford*

The need for the public to understand science today clearly echoes in the literature (e.g. Ziman 2001; Irwin, 2004; Miller 2004; Rooker 2001; Bond et al. 2007) and most begin and end without explaining what is meant by the term and what the indicators for it should be. Hagendijk, (2004) contends that this trend reﬂects an inherent assumption in the expression itself that the non-scientists appreciate scientiﬁc procedures and products and although research in this area has gained rapid momentum the last two decades, perspectives on the nature of public understanding differ as does the idea of competent scientiﬁc citizenship. The terms used for the process also vary across the literature , with 'understanding', 'participation', 'engagement' and 'science communication'. There is no consensus as to what public understanding operationally entails, which is also a result of clear lack of theorising the phenomenon and such a rare attempt is made my Rowe and Frewer (2005), who present a typology of mechanism of public engagement; public participation being a bidirectional process between the public and the sponsor of the initiative. Such a mode of public participation is reflected in citizen science, in which non-scientists have a more active role in doing science, as opposed to simply being recipients of scientific knowledge. However, the definitional and categorical ambivalence mentioned previously pose various methodological challenges in pursuing empirical studies of citizen science initiatives. Not only is there a conspicuous lack of theoretical contestations, this emerging mode of science is in need of contributions from the research community in building conceptual frameworks to inform further empirical investigations that will have implications for practice. This paper will highlight some of the difficulties in terms of designing suitable research framework to study such emerging modes of science which increasingly involve the public in the scientific process. Much of the contingencies arise out of the issue of expertise and nature of the area of scientific research. There have been numerous studies on scientific teams and scientists creating scientific knowledge through scientific methods and processes and there have been studies examining the public's response to public understanding initiatives mostly in terms of scientific literacy. The intersection of the two is an area that is sparse in literature and therefore, requires rethinking configurations of relevant literature, theories and concepts. What kind of questions should we be asking as researchers if we aim to explore how science is created in these new contexts and with new players? The exploration of this problem is what this paper aims to discuss, which could be critical in informing the research design for the study.

Extracting and embedding of local knowledge in Service Science, Management & Engineering (SSME). *yuriko sawatani, sts*

The discussion of Service Science, Management & Engineering (SSME, service science in short) has been stated by Innovate America in 2004. SSME is one of trans-disciplinary research area. In the discussion of Trans-science, important concepts are introduced, such as local knowledge (Geertz, 1983; Wynne, 1996), Framing (Goffman, 1974), Contingency (Jasanoff, 1997), and Selection of parameters in operationalization (Fujigaki, 2003) in STS. In service marketing, new way of approach to service, service dominant logic (SDL, Vargo and Lusch, 2004) is introduced. SDL suggests that traditional product oriented view, called as Goods Dominant Logic (GDL), treats customers as the target of products. I observe that STS treats field as the same as GDL, such as a research target. However, SSME research (Sawatani, Niwa, 2008, 2009) treats that the field where the service system exists is a mandatory element of the research, and is integrated with SSME research. In this paper, I studied how SSME research was done focusing on the treatment of local knowledge and found the following two key differences: 1. Value of local knowledge for scientists Whereas local knowledge in the field looks like "nice to have" in STS, local knowledge is essential for research activities in SSME. 2. Recognition of local knowledge Whereas people in the field have local knowledge, and that is expected in STS, local knowledge is discovered from people in the field in SSME. To understand how SSME research is done, I look into SSME research projects with IT operation outsourcing services. The research project was executed by researchers in IT Company, who are originally

computer scientists and becoming service researchers. Meeting minutes were written by researchers and collected in a database. The meeting minutes were analyzed to understand how local knowledge is used in the research projects. From these analyses, it was observed that understanding local knowledge by researchers was mandatory to define a research theme. Once researchers understand local knowledge and propose their viewpoints as the research model, which is extracted from local knowledge, then new local knowledge is generated by people in the field. The model developed by researchers via the extraction of local knowledge seems to facilitate the discussion between people in the field and researchers. People in the field do not recognize what local knowledge is, even though they have that knowledge. The model provided by researchers help people in the field to recognize what local knowledge is. Researchers develop hypothesis based on the developed model extracting local knowledge. Based on the hypothesis, researchers discussed necessary data to prove them with people in the field. This is to embed research hypothesis into the field. With this, when a research hypothesis is proved, then the result will be understood and appreciated by people in the field. In SSME research, these extraction of local knowledge and embed through selection of parameters in the field are key roles of researchers. I plan to look into local knowledge usage in SSME research deeper in the future.

Webs of Belief or Practices: the Problem of Understanding.

Stephen Turner, University of South Florida

Daston and Galison's Objectivity is a model of historical scholarship on a fundamental philosophical concept that is central to science. The subject matter is two ways of thinking about objective representation: truth to nature, or representation that brings out the characteristic features of a natural phenomenon, such as is found in medical illustrations, and mechanical objectivity, epitomized by machine-taken photographs of experimental outcomes. In this paper, I explain the philosophical background to the contrast between two models for the explanation of divergent fundamental ideas in science. The first, which is exemplified in Objectivity, is rooted in Quine and Davidson, and involves the notion that any given doctrine, statement, or concept is to be understood in terms of the beliefs which it is used to support, explain, or justify, and the facts which are implied by these beliefs. Quine famously uses the metaphor of the web of belief, to capture the idea that when belief is challenged by new facts or anomalies, the web may be adjusted at various different points in order to accommodate the new fact. The alternative, central to Kuhn and recently explicated by Sharrock and Read in their book on Kuhn, focuses on concepts and the practices that are the ground of concepts. This is a "stack" model, in which some set of basic items- concepts, premises, practices, or paradigmatic beliefs, is basic and beyond empirical refutation. The two models have different implications for "understanding": some connection between the conflicting scientific ideas needs to be made to allow their understanding. The web of belief model allows for this by something akin to translation, a process that can be understood in terms of error and revision. Discussions of "concepts" as an end-point to explanation, in contrast, are all or nothing: one can either grasp a concept or fail to grasp it. This picture of understanding produces an artificial problem of interpretation that the web model successfully avoids, with no loss of content.

112. Nanotechnology in Society: The Challenges of Equity, Equality, and Development

9:00 to 10:30 am

13: 1312

Science and Technology Studies, in opening up what is social about science and technology, has been deeply tied to issues of equity and equality. Lessons from STS scholarship are often lessons about the uneven distribution of risks and benefits stemming from scientific or technological developments, or uneven access to knowledge-making and decisions about technology. Feminist and constructivist approaches, for example, show how members of different social groups or genders are 'winners' and 'losers' both in terms of the implications of technoscience and in terms of participation in shaping technoscience. Specifically for emerging technologies, like nanotechnology, STS elucidates how expectations about who the winners, losers and decision makers might be are performative in influencing technoscience. However, the language of STS theories and lessons are not often phrased explicitly in terms of equity and equality. Consequently, debates about how to better guide nanotechnology and other emerging technologies - usually involving public or 'upstream' engagement and technology assessment - are at risk of unintentionally not treating equity and equality rigorously. The main goal of this session is to present work which articulates the social implications of nanotechnology specifically in terms of equity and which articulates how upstream engagement and technology assessment of nanotechnology might focus more explicitly on equitable outcomes and in processes. The session will address questions such as: Will nanotechnologies open equal career and business opportunities for women and for men, for advantaged and disadvantaged ethnic groups? For whom will nano products be designed? How will the global commercialization of nanotechnologies intersect with processes of human development within countries? Will processes to develop nanotechnologies engage and benefit the world's poor or leave them out? In addition to developing explicit frameworks for equity in STS, the session also contributes to the field by providing a crossover between STS and science policy, developing a common vocabulary for theoretical and spatial dimensions of equity and equality. Finally, in line with the theme of this conference on 'STS in Global Contexts' this session also contributes to STS by focusing on the social contexts of science in developing countries, something which the field still does not do enough. Session Format The session will draw on work from scholars from several universities on different continents are coming together to contribute to create a collected volume (The Yearbook of Nanotechnology and Society, Volume 2, Edited by Susan Cozzens and Jameson Wetmore). The session will begin with a brief overview of the framework of the volume and the status of the field of inquiry, followed by four detailed presentations, leaving ample time for discussion. Session is relevant to the following categories: M) Others (nanotechnology, emerging technologies); K) Science, Technology, and Public Policy Session Organizer Matthew Harsh, Arizona State University (mharsh@asu.edu) Session Participants Ravtosh Bal, Georgia Institute of Technology (rbal3@gatech.edu) Dean Nieusma, Rensselaer Polytechnic Institute (nieusma@rpi.edu) Matthew Harsh, Arizona State University (mharsh@asu.edu) Noela Invernizzi, Federal University of Paraná, Brazil (noela@ufr.br) and Guillermo Foladori, Autonomous University of Zacatecas, Mexico (gfoladori@gmail.com)

Participants:

Public Perceptions of Fairness in NBIC Technologies.

Ravtosh Bal, Georgia Institute of Technology

In recent years there has been an increase in the involvement of the public in science policy making often through the design of new institutional arrangements such as citizen juries and consensus conferences. Policy formulation that results from a democratic discourse among various stakeholders can reflect the values and preferences of citizens. Equity is one such value. The relationship between policy and equity in the arena of science and technology, however, has not been explored by many scholars in the field (Woodhouse & Sarewitz 2007). Those that have done so emphasize that equity considerations should be central to deliberations regarding science and technology policy In this paper, I examine the deliberations in the National Citizens Technology Forum (NCTF). The NCTF was a nation-wide public deliberative exercise to elicit informed public views about the development of nanotechnology for human enhancement. Organized as a consensus conference, the NCTF looked at NBIC (nanotechnology, biotechnology, information technology, and cognitive sciences) technologies for human enhancement. This paper looks at the equity issues that arose during the deliberations utilizing transcripts of participant online deliberations, final reports created by the participants, and data from surveys taken before and after the deliberations. I examine how equity as a value was defined by the participants and how their views of equity shaped their policy recommendations. I also use the survey data to see whether race, gender, income, and education have an impact on perceptions of fairness. An examination of how equity was dealt with in the

deliberations of the NCTF can help clarify the ways in which citizens combine values with their views and concerns about nanotechnology. The findings show that the participants possessed a nuanced understanding of equity and an awareness of the complicated relationship between science, society, and inequality. They were aware of the opportunities and threats to equity posed by nanotechnology as well as the uncertainty involved. The participants were not as concerned with the economic returns that nanotechnology promises but saw "quality of life" goals (Cozzens 1996) as important objectives that science should deliver. Of these, equity was an important concern for the public and has to be taken into consideration by policy makers in decision making for the latter to be responsive to and reflective of the concerns of the public. References 1. Cozzens, Susan. 1996. Quality of Life Returns from Basic Research. In Technology, R&D and the Economy ed. Smith, Bruce L.R. and Claude E. Barfield, 184-209. Washington, D.C: The Brookings Institution and the American Enterprise Institute. 2. Woodhouse, Edward and Daniel Sarewitz. 2007. Science policies for reducing societal inequities. Science and Public Policy 34(2): 139-150.

Materializing Nano Equity: Lessons from Design. *Dean Nieusma, Rensselaer Polytechnic Institute*

For decades, designers and design scholars have been practicing and theorizing means for addressing many of the inequalities arising from new technologies. As such, design scholarship has much to offer STS in thinking through the nature of—and mechanisms for facilitating—broader ("public") participation in technology innovation. Extending work in "upstream" science studies (e.g., Collins and Evans's (2002) "Third Wave" of STS and its various responses and Guston and Sarewitz's (2002) "real time technology assessment"), this paper applies insights from design scholarship to the making of nanotechnologies and the equity challenges that result. It reviews several threads in design scholarship that are especially useful in analyzing the design, production, and commercialization of nanotechnology-enhanced or enabled products, with an emphasis on understanding and responding to inequities resulting from those activities. Unlike in most STS accounts, however, this paper focuses on nanotechnology products and the processes used to create them—as opposed to basic laboratory research, innovation policy, or nano potentialities more generally. This approach directs attention toward the material embodiment and dissemination of nanotechnologies, which, in turn, enables consideration of a particular dimension of nano inequity, what I will call materialized inequity.

Equity and Participation in Decisions: What Can Nanotechnology Learn from Biotechnology in Kenya? *Matthew Harsh, Arizona State University*

This paper analyzes participation in decisions about emerging technologies from a perspective of equity. The methodology is comparative. Based on several years of ethnographic work examining participation in decisions about the development and regulation of biotechnology in Kenya, the paper draws out lessons for nanotechnology. It argues that access to decisions about emerging technologies is a highly sought after and unevenly distributed commodity. A focus on equity helps us understand that uneven distribution of access to decisions is linked to uneven access to resources, as well as to inequalities between groups distinguished by culturally-defined differences (such as race, gender and religion). For biotechnology in Kenya, scientific identity and access to scientific knowledge became one basis for creating culturally-defined differences which significantly limited access to decisions for some actors. To the extent that nanotechnology utilizes more complex and advanced science, it could create a new basis for unequal access to decisions based on unequal access to new scientific knowledge. Furthermore, the paper argues that an equity analyses can help us see how institutional frameworks (the configuration of connections between national and international research institutes, donors and the private sector) constrain where, when, and even if, decisions about how to develop technologies take place. The lesson for nanotechnology is that it is important to look beyond the more headline-catching technological innovations and focus on the perhaps more mundane realm of changing institutional structures behind nanotechnology developments, because these will shape participation in decisions. The paper contributes to STS by bringing equity into analyses of public engagement and participation in technoscience. Framing analyses in terms of equity emphasizes differential agency and the politics of participation. It particularly highlights the importance of connections between institutions, actors and scientific knowledge to those politics.

Nanotechnology Implications for Labor: A Prospective Study Based on Current Nanoproducts. *Noela Invernizzi, Federal University of Parana; Guillermo Foladori, Universidad Autónoma de Zacatecas*

In recent years, research on the social implications of nanotechnology has resulted in a number of studies that have led to debates both within and outside the academic community. The implications of nanotechnology for labor, however, have deserved little attention, despite their relevance for social equity and development issues at a global level. This presentation addresses the subject from an analysis of the characteristics of nanotechnology products that are already on the market. The analysis is based on two sets of data: the nanotechnology products inventory made by the Woodrow Wilson Center of Scholars (United States), containing products produced in several countries, and an inventory of products produced by Brazilian companies prepared by one of the authors. We grouped the innovative features and characteristics of nanotechnology products into four categories: a) the products are more efficient, b) the products are multifunctional, c) the products require fewer or/and different raw materials, and d) the products have a longer market lifespan. Although these categories frequently overlap, their analytical distinction is relevant because each has specific effects on employment. We show that nanotechnology will have a significant impact on employment distribution among production sectors, the international division of labor and skill requirements for labor, causing destabilizing effects on employment at the national and global levels. We anticipate job creation and job destruction that will be unevenly distributed within regions and countries, adding new features to job-related inequalities. Although job losses will not necessarily be absolute if we consider a company, a branch and even a country, at the global level and in particular for developing countries, significant negative impacts on labor are likely (except perhaps for some developing countries with huge markets). This prediction is based on the current socio-economic context in which nanotechnology is emerging, summarized as follows: a) a heavy concentration of capital in the development of nanotechnology in the richer countries and a few developing countries; b) nanotechnology products will lead to replacement of natural raw materials upon which many developing countries depend economically; c) the world economic crisis has reduced public investment in Science and Technology, the main source for research and development in many developing countries; and d) the growing free trade of recent decades will pressure for mass exports of nanotechnology products to developing countries, potentially accelerating the reduction and loss of jobs in local industries.

113. Public Participation

9:00 to 10:30 am

13: 1321

Participants:

Whatever happened to public participation on xenotransplantation in Canada? The meanings of "impacts" of public participation. *Mavis Jones, Communication Studies; Edna F. Einsiedel, University of Calgary*

References to impacts of public participation events have typically revolved around impacts on policy decisions. Calls for more or better evaluation have emphasized procedural metrics or

outcomes and impacts on participants. Not surprisingly, the determination of impacts on policy or institutions has been limited because of the challenges in penetrating bureaucratic walls or because of the complexities of isolating impacts of one factor in the context of other influences on the policy process. This presentation will focus on a follow-up of a Canadian national public consultation in 2001 on xenotransplantation. Xenotransplantation, or the use of animal cells, tissues and organs for human transplants was -- and still remains -- highly controversial. The consultation was conducted through an arms-length process and involved the use of citizen juries in six sites around the country. In an on-going follow-up study, we conducted in-depth interviews of policymakers involved in the regulatory process and participants from stakeholder communities who were engaged in the earlier policy discussions. We also analyzed internal policy documents to which we had been given access, allowing for a richer picture of the range of "impacts" and outcomes of this engagement process with publics and stakeholders. We argue that over and beyond input into policy decision, impacts can be understood in terms of institutional reflexivity and learning, changing norms, structural changes, and an 'opening up' of science and technology decision processes to a broader range of actors, knowledges, and values. We found participants in our research likewise identified a broader shift towards openness in policy cultures which they linked specifically to these consultative events.

How Specific End Users Can Interpret HIV/AIDS Biomedical Knowledge. *Kevin Corbett, Canterbury Christ Church University*

This paper reports on a study of HIV diagnosed respondents own understanding of the diagnostic/prognostic sero-tests routinely deployed within the field of HIV/AIDS biomedicine. Study respondents were consensually recruited from multiple community-based sites across one country inside the United Kingdom. All respondents undertook semi-structured interviews on their experiences of HIV/AIDS testing following sero-diagnosis. Interviews were transcribed and a discourse analysis was undertaken on the transcribed data in relation to user understanding of the three key HIV/AIDS tests: HIV antibody-tests, T cell or CD4 counts, as well as viral load or polymerase chain reaction tests. The theoretical framework for the study was based on a critical appraisal of HIV/AIDS biomedicine and its associated technological frames. A discourse analytic method was developed that focused on the modal affinity markers within the transcribed data (relating to respondents' co-constructions of each test) as users reworked the 'official' script of the tests. The findings showed that end users' own theorizing reflected the autonomous properties (or caveats) of the tests so further highlighting problems over the utility of these tests for illness prediction, especially when the predictions implied by the official test scripts actually failed. End users actively and fluidly engaged (and re-engaged) with different statistical/epidemiological frames of meaning for HIV/AIDS, thereby interpreting (and re-interpreting) sero-test results. End users' contingent and fluid affinities for the different frames of meaning also reflected different forms of judgment about HIV/AIDS biomedicine, based on different forms of knowledge. This particular lay epistemology was characterized by uncertainty about, skepticism of, and resistance to, the dominant retroviral paradigm of HIV/AIDS so directly affecting end users' behavioral intentions, perspectives and viewpoints. This lay epistemology also underpinned a continuum of end user responses to the 'true' nature and technical limits of the technology which epitomize both the characteristics of 'HIV treatment compliance/concordance' and those of 'HIV/AIDS dissidence' as perhaps a new social movement. It is argued that greater transparency over public experiences of these technical caveats is congruent with the spirit of quality assurance and current modes of socio-technical user engagement. The findings underline a need for better knowledge on the 'expectation gap' between test performance/caveats and how these autonomous phenomena are prospectively experienced and understood by specific groups of end users. A different mode of socio-technical user engagement is argued for that widens the scope for user evaluation, from that of a downstream mode of engagement with operational aspects of technical performativity, towards a more 'upstream' mode that engages users with formulating the scientific intentions of technical designs and the nature of the official test scripts.

Deficit required? The paradoxical construction of virtue and dignity in Norwegian biopolitics. *Marie Auensen Antonsen, NTNU, Trondheim*

This paper explores the co-construction of regulation practices and criteria for participation in regulatory debates in relation to human biotechnology in Norway. STS and PUS studies have for a long time criticized the use of the so-called deficit model in research about public understanding and engagement with science and technology. Still, the idea of an educated and well-informed public holds a strong position in many policy communities that engage with issues like science literacy, science policy and scientific and technological controversies in society. Science literacy, to use that term, is considered to be important to the conduct of a modern democratic society. Irwin (2006) conceptualizes this as new scientific governance, and shows how political efforts in recent years aspire towards a more democratic interaction between scientific communities, politics and publics, especially in dealings with newer techno-scientific developments. One example of this is the institutionalization of "consequence debates" concerning biotechnology (and also climate change\ global warming). Such initiatives are at the same time very much informed by the alleged "legitimacy crisis" regarding modern science and technology, a term that relates to the public skepticism towards both politicians and experts, and produces discussions such as mentioned above; of knowledge deficits versus knowledge diversity. Compared to this situation with an increased focus on science literacy, the paper analyses the paradoxical search for 'untouched' people to participate in evaluations of present developments with respect to human biotechnology. The preferred participants are expected actually to have as little knowledge as possible about the phenomena under scrutiny. The idea seems to be that the more deficits, the better. The dignified participant is expected to extol the virtue of being unrelated to any ongoing discussions and practices. Contemporary scientific and political endeavours concerning biotechnology have spawned their own institutions. The one I study here is the Norwegian Biotechnology Advisory Board, which exemplifies the paradoxical preference for knowledge deficits. I have interviewed members of the Board, analysed documents related to the board's activities and examined newspaper coverage of the board and its activities, to find out who are seen as fit to conduct the NBABs mandate, and how this is done. My focus is simultaneously on the ongoing formation of "agoras" (Nowotny et al. 2001), and on "the conduct of conduct". In other words, the Board's efforts to create and conduct what is considered more democratic procedures, leads to a preference for ignorance as a basic virtue of dignified voices in the deliberations about human biotechnology - in contrast to efforts elsewhere to promote knowledge.

Controlling Biotechnology: Representations of markets and the value of public participation. *Anders Johansson, Linköpings universitet*

Current discourses on the need to be competitive in a global knowledge economy have emerged in parallel with an explosion of experiments in more directs forms of public involvement in discussions on science and technology. This paper explores how potential tensions between ideas about technological innovation and public involvement are spelled out in discussions of new forms of governance and the establishment of new regulating bodies. We argue that an examination of such discussions will potentially reveal not only divergent stories about technological innovation but also diverging ideas about how technological innovations and potential markets for commercial products can be governed and by whom and what role is ascribed to citizens and concerned publics. How does the enterprise of increasing the

efficiency of research and innovation systems relate to and influence the growing demand for greater public participation in technical decision-making and policy formation? We believe that a closer examination of how actors talk about the possibilities and need for regulating new technologies will reveal implicit or explicit ideas about governance and innovation, about market actors and their respective roles and responsibilities, as well as potentially conflicting values between public participation and competitiveness on a global market. In this paper we investigate representation of markets and the balancing of values and in particular the value of public participation, in various actors' argumentation for their view of the biotechnology development in Sweden. In order to do this we empirically focus on two of the 21 suggestions for a Swedish biotechnology policy as presented by the Biotechnology Committee in 2000. The two suggestions we look at are the proposals to establish a Biotechnology Inspectorate and to establish a participatory risk assessment body, i.e. a Board of Technology. In our analysis of various actors' argumentations for or against these proposals, we identify: claims about biotechnology and potential markets (what kind of products the actors believe can be commercialised); claims about the role of market actors in shaping the products (producers and/or consumers) and whether the consumers' role is restricted to making well-informed choices once the products are on a market; claims about the possibility to regulate biotechnology and its potential markets and through what regulatory forms. The theoretical approach in this paper is inspired by Felt and Fochler's (2009) analysis of how models of innovation intermingle with ideas about the possibility to regulate technology developments as well as ideas about public involvement in such regulations. As we point out in this paper, the Biotechnology Committee report was met with scepticism and none of the proposals presented have been implemented. We have argued that this can be seen as an indicator that the idea of a stronger public involvement might end up as a case of 'repressive tolerance' when the European Union keep striving for becoming the world's most competitive economy by 2010.

114. Conduits of Knowledge in Network Societies

9:00 to 10:30 am

13: 1322

The proposed session "Conduits of Knowledge in Network Societies" (category "Science, Technology, and Public Policy") explores the direct and indirect benefits of collaboration in different technoscientific contexts. In the postmodern production of knowledge, information exchange takes various forms and conforms to local institutional practices. The panel addresses the criticism of STS: a lack of attention to the drivers/conduits of change and new forms of interaction among knowledge, innovation, and institutional structures. One of the outcomes of such interaction is the rise of interdisciplinarity aimed at the integration of fragmented knowledge, the ideal of STS thought (Cozzens, 2001). Integration often takes the form of collaboration, which may in fact be "the key element in S&T human capital development" (Lee and Bozeman, 2005). The panel focuses on the interconnected and mobile world of science both as a catalyst and a consequence of the development of successful scientific careers. The panel discusses various aspects of the diffusion of knowledge through human and organizational networks: 1) by studying the innovations and the mobility of inventors in the United States, Japan, and Europe; 2) by examining the role of international collaboration among and reverse migration of nanotechnology researchers in China; 3) by investigating the cooperation between government and non-government organizations and Internet users in Taiwan in the wake of the 2009 natural disaster; and 4) by scrutinizing decision-making in the peer-review process that identifies those who have made significant technical contributions to the computer science field. The scope of the presentations unveils the global network of science and technology with substantial attention given to the Asian scientific knowledge diffusion. These contributions are important for the future of STS because all (except one) papers are from doctoral students in STS. All papers are based on primary sources and original, dissertation/thesis level research, with strong methodological approaches. Cozzens, Susan. Making Disciplines Disappear in STS. In Visions of STS: Counterpoints in Science, Technology, and Society Studies, ed. S. H. Cutcliffe, & Mitcham, C. Albany, NY: State University of New York Press, 2001. Lee, Sooho, and Barry Bozeman. "The Impact of Research Collaboration on Scientific Productivity." Social Studies of Science 35, no. 5 (2005): 673-702. Discussant: Dr. Shu-fen Tseng, Yuan Ze University, Taiwan Presenters: 1.Hsini Huang and John Walsh, Georgia Tech, Public Policy, hsini92@gmail.com 2.Li Tang, Georgia Tech, Georgia Tech, Public Policy, litang@gatech.edu 3.Wei-Chu Chen, Yuan Ze University, Graduate School of Social Informatics, ibert@mail2000.com.tw 4.Irina Nikiforova, Georgia Tech, History, Technology, and Society, Irina.Nikiforova@gatech.edu

Participants:

Mobile inventors: Stars, Bridger, or Problem Solvers? *Hsini Huang, Georgia Institute of Technology*; *John P Walsh, Georgia Institute of Technology, School of Public Policy*

Mobile workers are seen as a key conduit for acquiring critical knowledge and improving innovative performance. However, we are left with the question of the mechanisms by which these mobile workers contribute to firm innovation. In order to answer these questions and further our understanding of the role that mobile inventors play in R&D and commercialization capability, we use the 2007 Georgia Tech inventor survey, with data on 1710 company inventors on triadic (US, Japan, and EPO) patents. The central question is why and by what means mobile inventor having more commercialized innovation. We examine the demographics of mobility, relations to information access, and the relations between mobility and innovative performance. Following the debates in innovation studies, this paper proposes to examine three explanations: human capital, social capital, and knowledge of organizational routines. The first explanation is that firm benefits from capturing the human capital embodied in these high-skilled mobile workers (Moen, 2005). Those high-skilled R&D workers, being called as "star scientists", may provide a key competitive advantage, both because of their creative talent, and because of their ability to access basic scientific information (Zucker and Darby, 1996). The second explanation is that these mobile workers bring with them their outside contacts, networking as the conduit for accessing complementary information from other firms (Agrawal et al. 2003). Such network-mediated information flows may be especially important when information transfer requires trust and/or exchanging fine-grained information as a return. The final explanation is that mobile workers have fine-grained information about organizational routines from their former organization (Becker et al., 2005). This information may be critical for developing innovations that are readily commercializable, given that commercialization often requires fitting "technology A" into a context of interdependent organizational routines (von Hippel, 2005). Put differently, we hypothesize that mobile workers could be more contributory in exploitative innovation than in explorative innovation. By introducing organizational routines theory, we hope to further specify the mechanisms by which mobile inventors incorporate prior knowledge to improve existing organizational routines in the new organization.

People are gone but not forgotten: US-China collaboration in nanotechnology. *Li Tang, Georgia Institute of Technology, School of Public Policy*

A growing body of evidence shows that China is becoming an emerging scientific powerhouse in terms of research output. In the field of nanotechnology, China has stood as the second highest producer of research only after the U.S. Meanwhile its research quality, measured by the number of citations, has also improved dramatically in the last decade. This rapid catch-up has come as a surprise to many, who are perplexed about how and why China has undergone such a transformation, particularly in cutting-edge fields. Among the main reasons cited is knowledge spillover due to international collaboration. Unfortunately, such a determination has been hampered by the limitation of publication data and the common practice of sole reliance on reported affiliations when determining international collaboration. Given the existence of Chinese Diaspora and reverse migration, this article developed a new concept-"Chinese knowledge moderator" to visualize the collaboration network

between Chinese and American nanoscientists. Two-dimension coding is further adopted to identify overseas Chinese and returnees who connect the invisible colleges on both sides through active co-publishing. Both network mapping and statistical analysis on CV and longitudinal publication data are used to examine the main principal element of higher research quality. This paper should contribute to current research in two ways. First, by taking into account researcher mobility and reverse migration, a growing phenomenon, it enters the discussion of the role of international collaboration and its impact on China's nanotechnology research performance. In a second way, related to the first, a two-dimension coding mechanism is developed to identify Chinese scholars who collaborate with both domestic and international researchers. Within my best knowledge, this is the first attempt to empirically examine the role of Chinese overseas and returning researchers on China's knowledge accumulation. Rooted in Burt's concept of a "structural hole," I argue that the unique network of CKMs empowers them to explore the ideas of two homogeneous groups, and thus it leads to a higher number of citations attributed to them and bolsters China's nano research on an aggregated level.

The Network Effects of Microblogging: the Vital Collaborator in a Disaster Event. *Wei-Chu Chen, Yuan Ze University, Graduate School of Social Informatics*

In August 2009, Typhoon Morakot attacked southern Taiwan and caused the most tremendous disaster in the decade. In this period, people used internet tools such as blog, Twitter, and Plurk to transmit great amount of relative information including emergencies, rescue actions and donations. The local governments subsequently reacted to this information pool and cooperated with enthusiastic internet users and non-government organizations for the purpose of active rescues and progress reporting. Employing social network sites (SNS) as a more efficient disaster information distribution mechanism may demonstrate the possibility of the governmental and non-governmental collaboration in the information society. In particular, in this case, these end to end users of blog, Twitter, and Plurk successfully employed collective networking power and played the vital collaborator in the event. This paper, first, conducts a web-survey to those people who used SNS to participate in this disaster event. Second, the local authorities, the rescuers, and the members in non-government organizations are interviewed. By quantitative and qualitative data analysis, this study aims at understanding how these microbloggers recognized themselves and reacted in this event, in addition, how the local governments could interact with non-governments by new ICTs. Finally, the development of microblogging and its roles for public participation in a network society are discussed.

Social Construction of the Turing Prize. *Irina Nikiforova, Georgia Institute of Technology, History, Technology, and Society*

Like many organizations, scientific academic associations bestow awards to recognize outstanding contributions. These awards typically fall within three categories: technical, educational, and service. This paper examines the selection process of the Turing Prize winners, scientists who have made significant technical contributions to the field of computer science, from the perspective of the sociology of scientific knowledge. It draws heavily from archival materials of the Association of Computing Machinery (ACM), which awards the Turing Prize - the equivalent of the Nobel Prize in computer science. Using the Latourian framework, the study examines the history of the peer evaluation process by which credibility was assessed. The paper argues that although the nomination and selection processes changed over time they relied on scientific rhetoric and knowledge based on trust (Shapin, 1994). In the process of selection, which involved assessing the background of the nominee (i.e., CV, "the balance sheet" of the scientist's investment) and the impact of his/her contribution, the selection committee weighed the justifications by introducing objective claims and subjective preferences for both the contributor and his/her contribution. The resulting controversies gave rise to the system of differentiation. Reaching consensus within that system was subject to small group dynamics where the status of decision-makers, quality of information and its diffusion through scientific network mattered. The analysis of evaluations suggests that the best intention and effort by the selection committee produces only partial outcomes due to the structure of the selection process and ambiguous criteria of evaluation. Among the number of identified criteria the most significant one was "being well known." Thus, consensus-based voting worked against minority and less known candidates, who had fewer allies supporting them. Based on the available evidence, the paper raises questions about the meaning of this award within the social order in which the credibility of a contributor and the contribution are identical.

Discussant:

Dr. Shu-fen Tseng, Yuan Ze University

115. Innovation in STS: Method and Scale in Sociotechnical Imaginaries - Part I

9:00 to 10:30 am

13: 1331

Despite the rapidly growing interest in the politics of science and technology in recent years, STS scholarship has devoted relatively little effort to theorizing the relationship of science and technology to mechanisms and institutions of political power. In order to fill the gap, the concept of "sociotechnical imaginaries" has been proposed, which we define as "collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific technological projects." By placing the mutually constitutive nexus of science, technology, power, and culture at the center of analysis, this concept has proved quite useful in rethinking the politics of science and technology. However, there still remain many challenging questions about how to empirically identify sociotechnical imaginaries and methodologically investigate them. How and at what levels do those imaginaries emerge and get institutionalized? How do they move from sub-national to national level or vice versa? Once they are firmly established at the national level, how do they, if at all, travel across national boundaries or become global? Are there cultural disparities in the formation and institutionalization of sociotechnical imaginaries—for instance, between the West and the East? And how do different disciplinary methods respond to the above questions? The aim of this double-session panel is to assemble a variety of empirical cases from Asia, North America, Europe and beyond, and to use these cases to reflect upon the questions of method and scale in exploring and analyzing the concept of sociotechnical imaginaries.

Participants:

Imaginaries & Scale: Nanotechnology Governance in the United States. *Regula Valérie Burri, ETH Zurich & University of Basel*

Science governance is deeply shaped by specific imaginations of the science-society relationship. Jasanoff and Kim (2009) have pointed to "sociotechnical imaginaries" that are expressed in the ways political cultures imagine social order related to scientific or technological projects. Following this perspective, this paper explores imaginaries in science governance in a particular political culture. Taking nanotechnologies in the United States as an example, the paper reveals the imaginaries and sociopolitical assumptions that are related to these emerging technologies and are expressed by relevant stakeholders. By drawing on interviews with policymakers and scientists, it is interested in the ways scientific innovation and its regulation are envisioned by involved actors in the US context. More specifically, the paper inquires how nanotechnologies, their risks, and their future are envisioned, and how their political handling and public involvement is projected by US stakeholders. Building on such investigations and addressing the methodological question of scale, the paper asks how such visions and perceptions of individuals can be seen as expressions of more general (sociotechnical, cultural) imaginaries related to a political culture.

Keeping Technologies Out: Absent Presences, Sociotechnical Imaginaries and National Identity Formation. *Ulrike Felt,*

University of Vienna

Over the past years contributions started to look at how technologies get inscribed into national political cultures and participate in the creation of what was labeled "sociotechnical imaginaries" (Jasanoff and Kim), thus in the establishment of imagined preferred forms of social life and social order organized around the development and implementation of technoscientific projects. This paper aims at taking a different turn and investigates what will be labeled "the sociotechnical imaginaries of the absent". More concretely the paper will investigate how nuclear power and genetically modified organisms participated in the creating of sociotechnical imaginaries in the Austrian context and how that again was tied into wider ideas of national identity. Both nuclear power and GMOs have been "banned" from the Austrian context through complex technopolitical processes, thus making this absence present in multiple ways. Using John Law's distinction, the paper thus addresses manifest technological absences, i.e. acknowledged and made explicit forms of absence, that have managed to occupy a space in the national context, to develop forms of materiality and to get woven into narratives that participate in the formation of sociotechnical imaginaries of a particular kind. The paper will first investigate the multi-sited processes through which these absences are made constantly present in order to keep the sociotechnical imaginaries alive. In a second move the question of how these "sociotechnical imaginaries of the absent" impact on upcoming new technologies such as nanotechnologies.

H1N1 and the Sociotechnical Imaginary of Disease. *Andrew Lakoff, UCSD*

This talk describes what might be termed a global dispositif, or apparatus, for envisioning and intervening in potential disease outbreaks. The dispositif includes both social and technical elements: epidemiological methods for tracking disease incidence; global communication systems designed to transcend national reporting systems; diplomatic agreements to implement collective response mechanisms in the face of threatening events; and contracts with pharmaceutical companies specifying the production and distribution of medical countermeasures. It both responds to and helps to sustain a global sociotechnical imaginary of disease: one in which disease outbreaks - whether from naturally occurring pathogens, intentional bioattacks, or as side effects of technological development - continually threaten collective health and social order across national boundaries. The talk will focus empirically on the debate over the WHO's declaration of H1N1 influenza as a pandemic - and the technical responses this declaration put in motion. It will ask: What is the collectivity that is brought into being through global disease tracking systems? And what populations are either included in - or excluded from - global systems of response?

Imagining Control: International Efforts to Prevent Malicious Technology Diffusion. *Samuel Evans, Havard University*

A major shift began to occur in the imaginary that supported multilateral export controls efforts after the Cold War ended. For all of the history of export controls, they have always been about three goals: preventing foreign supply of a technology; ensuring domestic supply; or as a tool for foreign relations. International efforts, until 1996, focused solely on the first of these goals. All of them are based on an adversarial imaginary of "us versus them". This is very different than the imaginary that has developed around new international efforts, most notable the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies. This new imaginary is collaborative, focused less on controlling who gets access to malicious technology and more on creating a global system that ensures that any such decision is made by a state and not an individual or company within that state. Each of these imaginaries has their basis in imaginaries developed within national export control systems; that is, some systems are based more on collaborative imaginaries and others more on adversarial imaginaries. In this paper, I analyze how these competing imaginaries are vying for the necessarily political will to reform the multilateral export control system so that it is more in line with their imagination.

Sociotechnical Imaginaries and Global STS. *Michael MJ Fischer, Massachusetts Institute of Technology*

This paper reviews the legacy paradigms of sociotechnical imaginaries as they have been deployed as global scientific projects (e.g., the IGY or HGP), as national-building of scientific capacity (e.g., the LBA or Biopolis), as regional alliances (e.g. the ASEAN SNP consortium), and as "switching points" in new configurations of "republics of science" as re-imagined for public futures, requiring increased distributed, and local expertises (biodiversity policy conflicts, new translational medicine initiatives such as THISTI).

Chair:

Sheila Jasanoff, Harvard University

Discussant:

Sheila Jasanoff, Harvard University

116. Guidelines, Evidential Standards, and Clinical Practice

9:00 to 10:30 am

5: 511

Participants:

Markets and Guidelines As Janus-Faced Miracles; Freeing health policy from visible and invisible hands. *Teun Zuiderent-Jerak, Erasmus University Rotterdam*

Healthcare markets and clinical practice guidelines are seemingly perfect opposites in health policy. Where guidelines are supposed to reduce practice variation in medical treatment, making care more similar across professionals and organizations, healthcare markets are generally expected to provide incentives for healthcare organizations to specialize and differentiate to create competitive advantages. Where guidelines summarize the state of the art of clinical research, leading to the detailed prescription and regulation of medical work, markets are expected to provide incentives for allocative, productive and dynamic efficiency, governing healthcare quality through de-regulation. Where guidelines could be seen as the prime example of the visible hand of regulating healthcare, markets are the archetypal example of regulating medicine through the invisible hand. These differences may however be deceptive. In recent work on the social studies of markets, Michel Callon and others have argued that market practices are not reflections of abstract market laws that are discovered by economics. Markets are framed in such a way that economic principles are enacted through market devices. Economics is thereby said to be a performative science, which implies that markets are not pure, abstract domains but tinkered spheres that have specific worths built into them. Similarly, the work by Tiago Moreira and others on the diversity of repertoires of evaluation in guideline production has shown how guidelines are not materializations of objectified clinical evidence but include diverse forms of knowledge that have to be assembled in relation to each other in a guideline text. Over the last decade, the black box of regulating through scientific evidence and of de-regulating through market laws have thereby been opened up for empirical scrutiny, showing that neither guidelines nor markets articulate a miraculously pre-given order. However, these two empirical fields have largely remained separate in analytical work in STS. This paper explores the theoretical machinery that emerges when discussing guidelines and markets in relation to each other. If guidelines are not manifestations of the visible hand of regulating healthcare, and healthcare markets no longer are spaces to let the invisible hand perform its efficiency miracle, health policy practices that used to be widely removed actually become closely related. I will analyze these similarities and their implications for STS theory and for health policy practices, by comparing case studies on the construction of healthcare markets and on the production of clinical practice guidelines. These case studies consisted of a combined qualitative methodology of participant observation and ethnographic interviews with clinicians, quality improvement managers and policy makers in

Dutch hospitals and elderly care institutions. Drawing upon the recent re-reading of Gabriel Tarde's Psychologie Économique by Bruno Latour and Vincent Antonin Lépinay, I will analyze the consequences of an agnostic study of health policy where guidelines and markets are brought back to post- rather than superhuman proportions. Analyzing the construction of markets and guidelines empirically, turns them into spaces in which the public good is tinkered with. How this is done thereby becomes a form of politics that STS researchers can then engage with.

Ordering healthcare through guidelines - on quantification, qualculation and nonqualculability. *Sonja Jerak-Zuiderent, Erasmus University*

Ordering healthcare is and has been an issue of concern for many and for ages. Particularly welfare state theories and practices have been busy in proliferating all kinds of formats of 'how to regulate healthcare'. In this paper we focus on guidelines as one specific investment and as one practiced strategy to tame healthcare. The development of guidelines in the Netherlands has started in the 80s and is often categorised as a rather qualitative approach to order healthcare worlds in the literature on healthcare regulation and improvement. However, especially since the introduction of the so-called 'regulated competition' in the Netherlands, guidelines have been increasingly getting company of more quantitatively oriented strategies to order healthcare - like for example the developments around performance indicators, diagnosis related groups, pay-for-performance schemes etc. These quantitative modes of ordering healthcare increasingly necessitate guidelines to adhere to a quantitative ordering format. As an alternative to this dichotomy of quantitative and qualitative modes of ordering, Michel Callon and John Law have introduced the notion of qualculation. This notion allows them to both understand and critique the increased importance of quantitative calculation in ordering practices. Other than calculation, qualculation includes judgement, making the calculative and non-calculative mutually constitutive. Following their work and its connection to Nigel Thrift's elaborations on non-representational theory, I suggest that guideline development is a fruitful site to explore the ordering practices of qualculation, but also of its opposite of nonqualculability which according to Callon and Law consists of rarefaction and proliferation. In this paper, I explore what kind of orders are enacted in the development and in the work with guidelines. I scrutinise how (non)qualculability is enacted. I do so by analysing in-depth sixty-seven guidelines that have been developed for twenty-five different diagnoses and by observing and interviewing members of guideline developing groups and care professionals working with guidelines. Through this research, I address the question how practices of guideline development and use render healthcare practices qualculable or nonqualculable. Specifying the practices of (non)qualculability in guideline production and use might enrich the understanding of cognitive equipments in ordering healthcare practices.

Prescribing blood pressure medication - Reduction in decision-making uncertainty and the shaping of clinical practice. *Sarah Wadmann, University of Copenhagen*

This paper explores the shaping of clinical practice in relation to the prescription of medication given for high blood pressure in Danish family practice. Blood pressure medication is a part of the daily lives of many Danes at a significant cost to taxpayers and patients. It is characteristic of the treatment of high blood pressure that it is rarely given to reduce symptoms, but rather to reduce the risk of possible, future complications. The lack of symptoms means that the definition of high blood pressure is based on numerical limits, and that blood pressure treatment is given on the basis of blood pressure measurements. The numerical limits have changed over time and remain a topic of debate among clinical researchers. This raises the question of how the definition of high blood pressure was conceived and what the understanding of this condition means when it comes to treating it. These are some of the topics dealt with in this paper. Based on a review of the literature and semi-structured interviews with general practitioners, a number of decisive elements in the decision-making process as regards the treatment of high blood pressure are outlined. By means of literature review, interviews with clinical specialists, public authorities and representatives from pharmaceutical companies, observations in general practice and at hypertension and pharmaceutical marketing courses, I explore how these decisive elements originated and attempt to uncover the information on which they are based. In the analysis I illustrate how a number of contextual conditions play a role in and have significance for clinical practice in this area, including social norms, evidence, government regulation and marketing of medicaments. A main argument of the paper is that it is characteristic of the shaping process that decision-making uncertainty is reduced throughout the process, so that doctors do not immediately have a sense of complexity in the treatment of high blood pressure. Another important finding is that stakeholders ascribe value to certain attributes of medicaments in their interaction with general practitioners, hereby influencing the perception of the medication. The paper illustrates some of the uncertainty and complexity underlying a clinical practice much taken for granted, it points out a risk of overlooking important clinical information, and it stresses that the treatment of high blood pressure not only reflects the needs of the population but also financial interests.

The special case of implementation. Towards problem-based governance in healthcare. *Roland Bal, Erasmus University Rotterdam*

The issue of patient safety is hotly debated in most healthcare systems as iatrogenic damage has been shown on many occasions. Healthcare is increasingly seen as unsafe and many policies are developed to tackle this. Despite the recognition that patient safety is to be seen as a 'systems property' many of such policies focus on a specific subset of safety issues, that are at once easily recognized as problematic and for which evidence is in place to tackle them. Examples are the prevention of decubitus ulcers and infections in hospitals. Not only are these types of issues relatively easily measurable, they also provide for relatively simple measures to tackle them. As a consequence much of the effort in patient safety initiatives is on the 'implementation' of such measures. In this presentation I will first go into the consequences of this approach to patient safety. What kinds of knowledge are produced with such a framing of patient safety issues and what kinds of responsibilities and accountabilities are assigned to actors in the healthcare field? Based on observations in several patient safety programs in the Netherlands, I will then go on to argue that this kind of framing is possible only for a specific subset of patient safety issues and that a more encompassing perspective is needed, based on the uncertainty in and complexity of practices of healthcare. I will draw on a number of ongoing research projects on quality improvement programs in the Netherlands to illustrate this and will outline the consequences for such a conceptualization on the governance of patient safety.

Where's the value in placebo comparison? *Andrew Turner, Institute for Science & Society, University of Nottingham*

The evidence-based medicine (EBM) movement and its favourite tool, the randomised controlled trial (RCT), have received some attention in the STS literature; mainly in regard to the processes by which clinical research is translated into therapeutic knowledge. In the case of RCTs, this has encompassed both the macro and micro politics of evidence-making. For example, studies have ranged over the international regulation and administration of clinical trials, as well as examining the production of clinical practice guidelines. Where EBM has been the subject of study, the focus has been its interaction with alternative medicines and its role as a professionalization strategy and a strategy for managing therapeutic uncertainty. Less attention has been directed towards EBM considered as an epistemological thesis: criticism of the idea that the RCT is an evidential 'gold standard' is one epistemological theme taken up in the philosophical, but not STS, literature. I will examine an

aspect of the epistemological content of EBM. By drawing on the clinical research and theoretical work on placebo effects, I will examine the idea (which is at the heart of EBM) that efficacious treatments necessarily outperform placebo in an (ideal) RCT. Research into placebo responses has generated some unintuitive but well supported and fairly uncontroversial results - especially in relation to pain. However the consequences of this kind of research have not been either fully drawn out, or consistently applied to our understanding of placebo comparison. I argue that some intuitive notions about placebo comparison do not stand up in the light of this research. I also argue that we need to give further thought to the significance we attach to placebo comparison. Particularly in relation to the normative assumptions that inform our views about what kinds of placebo comparison we ought to do. I consider first the effect that research into placebo responses has on our understanding of placebo-comparison in clinical trials, especially in regard to the argument that there is in fact no sustainable notion of 'a placebo'. I then examine the consequences this has for the common idea that placebos are not efficacious. I argue that on a more sophisticated understanding of placebo effects, this intuitive idea is not merely false, but in fact does not make sense. Secondly, I argue that we cannot understand placebo effects unless we are supplied with further arguments about which aspects of a treatment we are supposed to value the efficacy of. The point I stress here is that on any understanding of placebo effects, arguments are needed that tell us which placebo-comparisons are important, why they are the ones we ought to do. The key conclusion I draw is that the RCT is value-laden at the most fundamental level.

Drugs, knowledge and financial incentives: the case of English community pharmacy. *Ruth McDonald, University of Nottingham, UK*; *Sudeh Cheraghi-Sohi, University of Manchester*; *Caroline Sanders, University of Manchester*; *Darren Ashcroft, University of Manchester*

Recent reforms in England are aimed at enabling the public to manage their medicines, with community pharmacists acting as knowledge brokers. These reforms which provide financial incentives for pharmacists to undertake reviews of medicines within purpose built consulting rooms have the potential to raise pharmacists' status and empower patients. In a context where pharmacy has lost its traditional role of compounding drugs from constituent ingredients and has always been subordinate to medicine, pharmacy has been described as an 'incomplete profession'. However, an alternative view is that pharmacists can use their knowledge in exchanges with the public to transform drugs from material to social objects contributing to the active management of the social order. Our research (based on interviews with over 70 pharmacists) found that the financial incentives which accompanied reforms resulted in the distortion of priorities and rendered pharmacists dependent on 'consumers' to achieve targets. Furthermore, the target regime created divisions between professionals, with pharmacists telling atrocity stories about fellow professionals whom they accused of gaming the system. The target system and the divisions it appears to be creating, together with a willingness to critique members of the profession in public, are likely to be detrimental to the status of the profession. Similarly 'tick box' exchanges of 'knowledge' with patients, undertaken by pharmacists in order to meet volume targets imposed on them, are unlikely to raise the status of pharmacists in the public's eyes. Furthermore, competition, which is intended to improve responsiveness to consumers, means that developments such as internet pharmacy and home delivery of medicines are reducing opportunities for direct contact between pharmacists and the public. This makes it more difficult for pharmacies to play the part envisaged for them in government policy, in the maintenance of order within the health care system. The implications in terms of more inclusive forms of knowledge creation and a more equal distribution of power in society are complex. Pharmacists may be seen as professional gatekeepers to knowledge/ knowledge brokers potentially keeping patients in the dark, to some extent. Recent developments may be interpreted as illustrating a move away from a reliance on 'professional' knowledge. However, an alternative perception is that pharmacists provide a counterbalance to the primary care doctor, with patients able to approach pharmacists (no appointment necessary) when they are unhappy with and/or unwilling to contact their doctor. So these developments which threaten to reduce the status of pharmacists and their contact with the public may result in greater reliance on the medical profession as opposed to a more equal distribution of power in society.

117. Politics in Unexpected Places

9:00 to 10:30 am
5: 512

Participants:

Why We?: The Politics of Collaborative Action of Technology and Human. *hyunkyoung cho, soongsil university, Dept. of Digital Media*

This study analyzes the political meaning of collaborative action of technology and human performed in the artistic application of technology, in order to understand how the collaborative action of technology and human cultivates the collaborative politics. New scientific and technological disciplines make new and different orders, values, and perspectives. The emerging technology such as Human-Computer Interaction, Artificial Intelligence, Artificial Life, Networking, Tangible and Wearable Computing shows that there are multiple ways to shape and share the collaborative relationship between Nature, human, and technology. The collaborative action of technology and human establishes the collaborative politics which does not define 'I' but performs 'we.' In particular, the computational technology endowed with the intelligent and emotional qualities has a certain degree of autonomy that evolves its own laws, and can customize emergent actions beyond the control of human. With the capability of autonomy and emergence, the technology performs the collaborative action with the human. It presents that the collaborative action of technology and human is a new mode of production of human action, and it reconstitutes the existence of human and its condition in the digital environment. At this point, the collaborative action of technology and human involves with the politics. The contemporary technology-based art reflects on the artistic application of technology. It presents the political power of collaborative action of technology and human. Unlike the traditional artwork completed by the action of artist, the artwork using the technology consists of the collaborative action of technology and human. For one artistic purpose, the technology and human act and react with each other, and their collaborative action becomes artwork itself. In the process, the technology plays as one of artists creating artwork. It implies that the collaborative action of technology and human challenges the fixed meaning and conventional authority. Here, the artwork functions as a political activity to produce and distribute the politics of collaborative action of technology and human. It criticizes the problematic of knowledge systems reinforcing the mutual degradation between action and thought, technology and human. To escape the binary frame, the collaborative action of technology and human in artwork intervenes on two fronts. First, it proposes that the action is not the instrument to represent the ideals, insofar as it retains the existence of human and its condition. Secondly, it insists that the technology is not the instrument to order the human and Nature, since the instrumental understanding of technology is the binary frame of subject/object, and human/nonhuman based on the human's hubris. In conclusion, the political power of collaborative action questions what are we, not what am I. It is to link between action and thought as well as technology and human into a life as the multiplicity. It reminds us that "life is not determined by the consciousness, but the consciousness by life," and what the human is, therefore, coincides with the production of collaborative action, both with what he acts and with how he acts with the technology.

Analysis of Chinese dynasties' alteration in history from the

view of life science. *yong chen, graduate university of Chinese Academy of Sxiences*

China is a country with long history. There are over 3,000 years in written from Zhou Dynasty. It's a giant project to go deep into it. Referring to the real data of Chinese history, the authors sum up the rule that several primary dynasties rise and fall, i.e. , the average years that every emperor governs is the same with the human natural generation ages. In this article, according to contemporary life science and human health, the authors analyzed the law of all dynasties' alteration in Chinese history, opened out three characters of it, and the connection between three characters and the emperor's body-and-mind health. The characters were consisted of three aspects. The first one is space which is uniform and independent comparatively. The second is the time which is continuous and centuries-old. And the last is the most important, that is one dynasty cycle is about 200-300 years. We have get two main conclusions: 1. The average years that every emperor governs is the same with the human natural generation ages. 2. Every unitive and stable dynasty can only last 200-300 years at most. Once it's over 300 years, huge turbulence will appear obviously. Ancient history and modern science have the coincident cognition about human natural generation ages in detail, that is 20 years. The new conception from WHO for life health involves physiological health, psychological health and intellective health. Seeing about these three contents, we can suppose that life health general index (index for short) of state-found emperor is double of common people, and the excellent genes are completely expressed. After calculating with genetics method, we find that all excellent genes almost vanish by 11 generations' inheritance. That means the emperor has equal life health general index with the masses. When the emperor's index is alike with common people's, his ability to deal with inside-and-outside pressure and emergence falls down apparently. Therefore, when the crisis appears, unapt management will result in more amplificatory crisis, even the empire destruction. And at the same time, new emperor with excellent genes certainly will replace the ultimate one. We can infer further that "emperor's crisis" leading dynasty changing is not always much bigger than other crises in course of the current dynasty at scope and level. It is more because the index of current emperor keeps falling down . So when the crisis comes out, the last emperor loses the ability to deal with it, comparing with his ancestors. There are heredity and variation, which makes it clear that some dynasties last longer and some shorter. It's not all 10 or 11 generations. Emperor's mate, empress or queen, also reacts significantly, since her genes which are superior or inferior, can work on the length of the dynasty.

Global public opinion and the role of digital infrastructures in viral marketing campaigns. *Dina Friis Toft, Copenhagen Business School*

This abstract contributes to STS by contemplating the role of digital infrastructures when facilitating global spreading of messages. The paper presents and analyzes empirical examples of how public opinion is both a resource and a challenge, when it comes to strategic online viral marketing. Based on empirical data from three viral marketing campaigns, the paper considers the role of the digital infrastructure, which acts as both mediator and intermediary when advertising content is spread globally. All three campaigns were initiated by Danish, government funded agencies. The aim of two of them was to change the behavior of Danes, while the latter should make foreigners aware of Denmark as potential tourist destination. Further, all three were initiated by uploading a short video to the Internet, but without making any direct connection to the campaign. This caused people to circulate the videos, exchange opinions about their content, as well as guessing at their intended meaning. This strategy allows a campaign to gain a great deal of public attention before the creators reveal themselves and their message. To ensure exposure, even the campaigns targeting Danes were in English, thereby deliberately reaching beyond their target audience, the Danish public. In this particular type of campaign, public opinion plays an additional role next to that of changing a specific group of people's behavior. It also serves as facilitator for spreading the word globally, without necessarily knowing what it is, or being limited to the intended target group of the campaign. One of the consequences of relying on public opinion, in particular when considering global distribution is that local receivers may react in unintended ways. For example, at a traffic conference in Sweden, several Swedes left the room in protest over the content of a video promoting safe driving speed. Outside they were met by the press who turned the reaction into headline news, and thus also into a political matter. News of this crisis between Denmark and Sweden spread to other countries, resulting in not only forcing a Danish minister step forward, but also in an increased exposure as even more people became aware of and saw the now controversial video. Such an unexpected, yet hoped for, turn of events is both desirable and risky. Hubs such at mass media, popular blogs, or politicians may boost awareness, allowing the message to spread faster and further than it would through individuals alone. However, the debate of the controversy behind this attention may also distort or drown out the original message. Even worse, the debate may even reflect negatively on the message itself. This calls for reconsideration of the implications when attempting to engage, yet still control, public opinion, in particular when that engagement is global, and hence spans both national and cultural boundaries. Bio: Dina is PhD student at Copenhagen Business School. She is working with viral marketing, a strategy where brand awareness is created by inviting users to engage with brands and advertising using their own needs, interests and views as promoter for the campaigns.

118. Towards Constructive and Critical STS on Nuclear Issues: Reflexive Investigation into 'What Has Not Been Told'

9:00 to 10:30 am

5: 513

The six decades of the development and utilization of nuclear energy have triggered many serious disputes in every society which utilizes the technology. There are studies on nuclear issues by STSers as well as other social scientists such as political scientists, sociologists, and so on. Especially, the social conflicts around the siting of nuclear power plants (NPPs) are one of the most popular topics among those studies. Associated with the topic, the progress of research and practice on so-called participatory decision-making processes is also driven by nuclear disputes. However, what we face in the interface between utilization of nuclear energy and society is much broader. Accidents in nuclear facilities often trigger serious social disputes, even if the accident is regarded as "very trivial" by technical experts. The siting of nuclear facilities except for NPPs also becomes a big political issue. Especially in developed countries the difficulty in finding the way to the relevant disposal of the high-level radioactive waste (HLW) looms large. And the possibility of nuclear warfare and proliferation still exists. Nuclear issues that originated in the World War II have a long history and yet they provide very contemporary and urgent issues both for developed countries and developing countries. Does current STS research makes sufficient contribution to the clarification of and the engagement with nuclear issues thus understood in a broader context? Is the output from STS research is more insightful and/or useful than conventional social scientific research for the democratic decision-making process in civil society? Our tentative answers are not so positive with respect to both questions. We cannot say "yes" without reservation since there are too many stories about something nuclear that have not been told up to now. In this session, through presentations and discussion, we will try to make clear the social implications of what has not been told with reference to various different nuclear issues. Based on the clarification, we would like to obtain a prospect for a prototype of constructive and critical STS researches and practices which will be built on meaningful collaboration between experts, policy-makers, and citizens.

Participants:

To seek a 'better' means for risk agenda-setting: 'Let sleeping dogs lie' or 'Storm makes oaks take deeper root'? *Tatsuhiro Kamisato, The University of Tokyo*

Recently in Japan, a variety of risk issues have turned into social problems, for example the dioxin panic, several food safety issues, the asbestos scandal, railway accidents, loss of confidence in the medical system, and cases of inadequate seismic capacity

of buildings. Once a particular risk issue is set as a public agenda, it receives extensive daily media coverage, thus generating a broader social impact. Therefore, it is essential that our society decide which risk issue should be prioritized and how many social resources should be devoted to it. Generally speaking, if the amount of social resources devoted to the risk issue is remarkably unproportional to the "real" magnitude of the risk, it would be "bad" for our society (Of course, it would be important to first consider how we could learn the "real" one). Moreover, it is concerning that although an important risk issue may exist, we may not be able to perceive it if it is concealed by other prominent and conspicuous risk issues. This could be "really dangerous." Fortunately or unfortunately, in the past ten years, the nuclear issue has not been a chief public risk agenda in Japan. As a result, this issue poses a concern only to its "active" supporters and opponents. Hence, there is neither an opportunity nor a suitable platform to discuss the issue with wide public participation. In short, there have been no substantive public debates on the nuclear issue in Japan. How can this be remedied? In such a situation, which proverb should we turn to, "Let sleeping dogs lie" or "Storm makes oaks take deeper root"? In this presentation, by comparing the nuclear issue with other risk issues, I would like to consider a "better" means for agenda-setting or creating adequate opportunities for public debate on this nuclear issue.

Design of decision-making process and feedback from sociological STS study: The case of a high-level radioactive waste disposal program in Japan. *Kohta Juraku, The University of Tokyo*

Japanese society has had many experiences with the siting of nuclear facilities for about 50 years. There were several dozen local decision-making processes, and not a few cases gave rise to complicated disputes or controversies. Also, many journalists, citizen activists and, of course, academic researchers dealt with those cases as their cases to propose critical messages against the formal scheme of NPP siting. Since the latter half of 1990s, the Japanese nuclear governance system has been reformed, partially triggered by such criticism. The decision-making process in the nuclear field has gradually become more transparent and more open for publics. The design of siting process of a high-level nuclear waste (HLW) disposal plant, established in 2001, is one of the outputs of that trend. The implementer of HLW disposal, NUMO (NUclear waste Management Organization) adopts a kind of open application process in their disposal plant siting process. They call it an "Open Solicitation Process". This scheme looks very nice because we can see that as a kind of "participatory" process. However, they couldn't find any candidate site up to now. Why did they "fail" to learn from the past lessons of nuclear disputes? Why did the new scheme which considers openness and transparency not function well? In this paper, I would like to point out the lack of channels which enable fruitful feedback from the history of controversy by illustrating the intention and mindset of stakeholders who took a role in the design of the current HLW siting process. Also, I would like to discuss the possibility of contributions by STS about this issue.

Between Advocacy and Analysis: Reengaging with Nuclear Energy in Science & Technology Studies. *Sonja Schmid, Virginia Tech*

Nuclear energy has been a topic of investigation in Science and Technology Studies since the 1970s. STS scholars have analyzed the anti-nuclear movement, nuclear rhetoric, and how nuclear energy intersects with culture, national identity, and forms of governance. Typically, this research is based on detailed case studies, and frequently involves controversies over some aspect of the nuclear industry. Since then, both the academic field of STS and the nuclear industry have matured. While earlier STS studies on nuclear energy were often guided by a critical stance, recent work in STS has refined its repertoire of conceptual tools and theoretical approaches to study knowledge as a social phenomenon. By the same token, the nuclear industry has been gaining renewed traction as concerns about carbon emissions and related climate effects escalate. In the light of the recent "nuclear renaissance" I take stock of what STS has contributed to our understanding of nuclear technologies, and how it might do so in the future. STS studies derive their strength from the attention to detail, and the complexity they are able to analyze. I argue that scholarship in STS can provide significant insights particularly in two areas: first, it can help us understand the intricacies of large technological systems, which include not just technical artifacts and processes, but also persons, practices, and regulations. And second, it allows us to appreciate the communication processes involved when the public is confronted with high-risk technologies, whether this is in the context of facility siting, industry regulation, or emergency preparedness. Drawing on a number of case studies I argue that STS research has yet to reach its potential when it comes to engaging with contemporary debates in the area of nuclear energy, and that it can do so without necessarily taking sides.

Lessons learned from Open Forum on Management of High Level Radioactive Waste. *Ekou Yagi, Osaka University*; *Masaharu Kitamura, Tohoku University*

The issue of high level radioactive waste (HLW) management has become critically important in Japan since the number of spent nuclear fuel assemblies is approaching to its limit for storage in most nuclear plants. On the other hand, local governments are highly reluctant to accept the HLW repository. They are even reluctant to accept a preliminary inspection of the local area to examine geological suitability as the repository. The importance of public participation in solving conflicts between technology and society has been addressed in various academic sectors such as STS and regulatory policy making. The authors believe that the issue of HLW management must be properly handled by taking guidelines derived from the STS theories into consideration. However, as far as the authors know, no attempt has been made in Japan for trying to make use of the STS theories for solving the problem. The authors have been engaged in an attempt called "dialogue forum" where citizens and nuclear experts get together to reduce cognitive gaps between the two sectors. Through the attempt, guidelines derived from the STS theories have been utilized to make the dialogue more effective. On the basis of the experiences of dialogue forum, the authors have designed and tested another scheme of public meeting named "Open Forum on Management of High Level Radioactive Waste" with emphasis on development of effective public participation scheme. Two speakers have been chosen to state pro- and anti- nuclear opinions. The number of speakers was minimized in order to encourage in-depth discussions while avoiding divergence of arguments. Particular attentions have been paid to avoid asymmetry of discussions between the two speakers. Both speakers were asked to answer an identical set of key questions obtained from pre-registered participants. Also, facilitators tried to equalize the number of questions raised from the floor. Two consecutive forums have been carried out in 2007 and 2008 with the same speakers and facilitators. Although no clear consensus has been attained concerning the HLW management, the majority of the participants expressed highly positive evaluation of the attempts in many aspects. They also expressed their willingness to participate in a follow-up forum. Based on such positive responses, the STS theories are regarded helpful in deriving the design and operation principles of the forum. At the same time, however, it became clear that participation of experts with broader academic background (e.g. ethics, economics, regulatory science, policy science, etc.) is definitely needed. Also, various tools of knowledge visualization and compilation must be developed and utilized to make the complicated issues visible. In this regard, it can be concluded that an intensive collaboration of STS scholars with experts in other academic domains is necessary for constructive public participatory discussion on nuclear and other controversial issues. Conflict resolution in these issues can only be achieved through such trans-disciplinary collaboration activities, even though another type of conflict can be envisioned in such collaboration.

What Is Not Told Within Organizations: Opacity, Nuclear Reactor Safety, and Nuclear Weapons. *Lynn Eden, Stanford University*

Organizational action is to a large degree based on "knowledge-laden" organizational routines: standard procedures that contain assumptions and knowledge about the way the world works. I ask and answer three questions. 1) How are assumptions and knowledge, particularly technical knowledge, developed in organizations? 2) What causes—or prevents—change in assumptions and knowledge? 3) What kinds of internal organizational barriers exist that can prevent knowledge from being updated or incorporated into routines? Largely drawing on two rich case studies, anthropologist Constance Perrin's Shouldering Risks: The Culture of Control in the Nuclear Power Industry, and sociologist Lynn Eden's Whole World on Fire: Organizations, Knowledge, and Nuclear Weapons Devastation, this paper teases out causal claims about opacity in several nuclear reactor accidents or near-accidents and in knowledge about the damage caused by nuclear weapons. In examples from the above studies, supplemented by additional examples, this paper argues that at least two paths exist to cause incomplete or distorted understandings to become incorporated into organizational routines: 1) continuing complexity in the interaction of physical processes and routines that obscures understanding of phenomena and 2) an historical too-thin characterization of phenomena that builds in distortions that become perpetuated. The paper brings a concern with nuclear issues and a close examination of organizational assumptions and routines from organization theory to the science and technology literature.

The Globalization of Nuclear Power: A Discursive and Political-Economic Perspective. *William J Kinsella, North Carolina State University*

This presentation directly addresses the 2010 4S conference theme, "STS in Global Contexts." The presentation draws upon a comparative study (now underway as a Fulbright research project) of the US and German nuclear power programs, supplemented with observations of other nation's programs and emerging international trends, to argue that the discourses, politics, and economics of nuclear power are becoming increasingly globalized. Although the majority of STS scholarship on nuclear power issues has examined local, regional, or national-level case studies, these analyses can only incorporate globalization issues as secondary elements. Such approaches remain essential, but there is a growing need to combine them with analyses that operate at a more macro global level. The globalization of nuclear power is driven by a number of factors. The scale of nuclear power projects, from facility design, to construction, fueling, operation, and eventual decommissioning, increasingly demands international participation in research and development as well as financing, insurance, supply, and marketing. Technical expertise, materials, and components increasingly come from geographically diverse sources. Nuclear fuel reprocessing and waste disposal are increasingly being framed in international terms. Regional political alignments such as the European Union produce nuclear energy policies that transcend national governments and generate tensions within the larger political entities. Projects such as the US-proposed Global Nuclear Energy Partnership and the proposed US-India cooperation agreement can be viewed alternatively as progressive international development efforts, or as attempts to sustain a troubled US Industry by globalizing that industry's market. Weapons proliferation concerns, crucial to international nuclear trade agreements and to IAEA regulation of nuclear facilities and materials, are inherently global problems. The potential consequences of major nuclear accidents are transnational, as is the problem of global climate change that drives much of the current effort to promote nuclear power. With this global context in mind, this presentation develops a framework for analyzing the discourses, economics, and politics of nuclear power in global terms using resources from STS, communication studies and rhetoric, and globalization theory.

Chair:

Miwao Matsumoto, The University of Tokyo

119. Envisioning New Futures for Engineering

9:00 to 10:30 am
5: 514

Technological imaginaries serve as a powerful vehicle for envisioning new futures as well as for upholding various established boundaries of social, professional, and national identity. This session presents the audience with a set of empirically grounded analyses, drawn from different disciplinary traditions and specifically designed to explore the global dimensions of this phenomenon. Beginning with Paulitz' historical and contemporary sociological analyses of the gendering of the German engineering profession, the session turns to Chang's examination of the hybridization of national identity and engineering practice, as exhibited through a close study of a high-profile Taiwanese inter-regional high-speed transit project. It then proceeds to Lagesen's study of how consulting engineering companies are dealing with environmental concerns and doing things to implement new visions of "green design" within the Norwegian context. The session closes with Buch and Jørgensen's multi-sited ethnography of engineering design experience, a study that documents the substantial tension that exists between new, academically cultivated "design" identities and the practices and practical demands asserted by established workplaces and preexisting occupational identities in the Danish context. The papers within this session also examine different types of engineers—industrially employed engineers, consulting engineers, engineering educators, and engineers employed by the state—and through this, help to shed light on the different kinds of tensions, struggles, and subjectivities that drive the reconstruction of engineering professional identities. Collectively, the papers within this session should also provide very strong opportunities for the comparative study of engineering in different national contexts.

Participants:

The Gender of the Theory/Practice Boundary: 'Boundary Work' in Historical and Current Concepts of German Engineering. *Tanja M. Paulitz, University of Graz*; *Saskia Fuerst, University of Graz*

The central starting point of the paper is the assumption that distinctions (boundaries) made in professional engineering knowledge and debates are relevant for gender research. In the history of German engineering especially, the theory/practice difference has been of major concern for the emergence of the modern understanding of technology. The questions of whether engineering is a fully rationalistic scientific endeavour, whether it is mainly an applied science or whether it is a more productive (rather than cognitive) version of science based on experience and tacit knowledge, have remained crucial for technological concepts. As a result, there have been different variations of boundary work between theory and practice within the field. The research project "Gendering Boundary Work in Engineering" (funded by the Austrian National Science Fund) which constitutes the broader background of my presentation aims at analyzing the constructions of gender that go along with these distinctions in the professional knowledge of engineering in the German-speaking area. Central questions are: Which social constructions of gender are connected with the theory/practice boundary? Which can be found in historical as well as in current ways of drawing the boundary? How are different constructions of masculinity co-produced with professional understandings of technology and of the discipline? How have these social constructions worked as excluding mechanisms? The empirical investigation will first comprise a longitudinal study: Professional discourse in engineering journals and its reflection in general knowledge as can be found in encyclopaedias will be studied comparatively. In addition, a qualitative cross-sectional study is designed for investigating different selected sub-domains of today's engineering. In detail the questions are as follows: How do gender-relevant patterns of the theory/practice distinction change in the long-run within the engineering professional discourse? Which patterns of distribution into general knowledge emerge? Which forms are currently

identifiable in more established or in more innovative sub-domains of engineering? Thus the theory/practice boundary is to be illuminated mutually in the diachronic process and in the synchronic distribution in order to get a more complex image of the social field of technology. The talk will provide a project outline and a first presentation of results.

Hybrid Engineering Practices in Taiwan's High Speed Rail Project: Conflicts, Struggles and Subjectivity. *Kuo-Hui Chang, STS, Virginia Tech*

This presentation shows how Taiwanese engineers conducted the Taiwan High Speed Rail (THSR) project through a hybridized engineering practice inherited from their social and political history. Among others, the THSR is mainly known for integrating the Japanese Shinkansen HSR core system with some Euro HSR civil designs. However, the THSR cannot be characterized as another Shinkansen, French TGV, or German ICE. While the Japanese have indicated in public statements that the THSR is not another Shinkansen line, this presentation argues that the THSR is a Taiwanized version of this system. In other words, the THSR was a technological reconstruction thoroughly embedded with local knowledge to the point that the original maker could no longer recognize their technology. The THSR project clearly reflects and enacts critical dimensions from Taiwanese culture and history. This presentation will also show that the Taiwanese paid some unwanted prices through this process of hybrid engineering.

Doing Environmental Concerns in Consulting Engineering. *Vivian Anette Lagesen, Norwegian University of Science and Technology*

This paper is an explorative study of how environmental concerns are enacted and dealt with among consultant engineering companies in Norway. Consultant engineers is a profession that through their work engage with important and wide-ranging environmental issues related to, for example, physical planning, construction of buildings, transport, and water management. Their main expertise resides in technology and architecture, and these companies play a key role in the ongoing shaping and reshaping of the physical qualities of nature and culture, of landscapes and the built environment. Consultant engineers have previously received relatively little attention, neither in previous research on environmental issues nor in policy-making related to sustainability. It is a highly knowledge based profession (Filiatrault and Lapierre 1997, Koch 2004). However, literature describes the practice of consulting engineers as more problem-driven than actually knowledge-driven (Koch 2004, Alam 2003). According to Koch (2004) project learning and reflection is limited by the logic of the single project economy, which he terms the "tyranny of projects" (Koch 2004: 296). This dynamic makes it difficult for consultant engineers to enhance knowledge production in and across projects. This may also impede enhancing and developing knowledge about sustainable and green design among consultant engineer. On the other hand, it seems to be a widespread desire to make important areas of consulting engineering more sustainable. Environmental concern can thus be interpreted as being a mix of knowledge-based and moral performances. In this paper we investigate how consulting engineers perceive their responsibilities as well as their competence to deal with such concerns. Are they expressing concern for the environment, and are they trying to implement their concern in their practices? What are the opportunities and challenges in providing environmentally sound consulting engineering services on a commercial basis? What may improve their ability and opportunity to provide their clients with high-quality environmentally oriented expertise? What is actually considered to be environmental knowledge in the context of consulting engineering services?

Multi-Sited Ethnographies and Studies of Engineering Practice. *Anders Christian Buch, Technical University of Denmark*; *Ulrik Jørgensen, DTU Management*

The reproduction, development and transformation of engineering work and culture have been the focus of a number of theoretical and empirical studies over the last 60 years or so (Barley 2005). In the 1950'ties and 1960'ties the predominant perspective was that of the engineering profession studied by sociological (Weberian) methods including studies of engineers serving authoritarian regimes. In the 1970'ies the perspective shifted to Marxist inspired discussions of the engineering profession in relation to class structure in parallel to studies of engineering education and skills from a perspective coming from Industrial Sociology. Over the last 30 years the studies have - to a large extend - used ethnographic and grounded methods in order to investigate the specifics of engineering practices in situated perspectives. Thus the overall trend has been from a macro to a micro perspective. We argue that this trend has - in many respects - led to a richer and empirically sensitive perspective on engineering work and culture. Thus, detailed studies of engineering work practices or engineering education provide new material for a richer understanding of engineering culture. On the other hand, however, the specific and strictly situated focus of these studies threatens to limit discussions of engineering practices to departmental and discrete institutional settings. We propose a research agenda that - inspired by George Marcus' multi-sited ethnographic methodology (Marcus 1998) - sees (and contrasts) engineering practices in diverse settings (e.g. engineering education and engineering work) in order to uncover the material-discursive transformations in these practices. In our discussion we will outline the research perspective we intend to use in our study of engineering practices in the research program PROCEED. Our study will rely on the fundamental presumption that engineering practices are produced and reproduced in two - different, but mutually constitutive - institutional contexts: one located in institutional settings that are concerned with the reproduction of engineering knowledge and skills, i.e. engineering education and research, and the second based in engineering work, institutionally situated in organizations and companies. Thus our study will address these two institutional contexts by investigating their fields of material-discursive practices. Engineering work and education are not viewed as distinct spheres performing independent versions of engineering theory and practice but as one of interplay and mutual constituency. References: Barley, Stephen R. (2005): What we know (and mostly don't know) about technical work, in Stephen Ackroyd et al.: The Oxford Handbook of Work and Organization, Oxford University Press George E. Marcus (1998): Ethnography through Thick & Thin, Princeton University Press

Chair:

Maria Paula Diogo, FCT, Universidade Nova de Lisboa

Discussant:

Gary Downey, Virginia Tech

120. Science Communication and Cultural Context

9:00 to 10:30 am

5: 515

Participants:

First view (Erster Blick): Communicative interferences in science, science journalism, and art. *Kristian Hvidtfelt Nielsen, Aarhus University*

This paper engages three communicative events involving one particular image of the silicon (111)-(7x7) surface produced by German researchers using Frequency Modulated Atomic Force Microscope (FM-AFM). Originally published in Science in 2000, the image was presented as the first ever depiction of subatomic features. The research team claimed that the image shows two atomic orbits of the front atom of the FM-AFM tip. Also in 2000, the German newspaper Frankfurter Allgemeine Zeitung used to the image in a popular science article entitled "Erster Blick in das Innere der Atom" (First View into the Interior of an Atom). Later that same year, the image appeared in an art print called Erster Blick (First View) produced by one of Germany's leading artists today, Gerhard Richter. The paper contextualizes these three communicative events all appearing in the millennium year of 2000 by means of Niklas Luhmann's system theory. With a few

exceptions, the work of Luhmann has received very little attention within the field of science and technology studies (STS). Luhmann's major work on science, Die Wissenschaft der Gesellschaft (1990), so far is still not translated into English. Moreover, the sparse STS literature dealing with Luhmann has tended to renounce his thoughts as being too focused on closed, functional systems as opposed to open and emerging networks. It is one of the goals of this paper to argue that in understanding science in terms of communication on a par with other important communicative institutions in society, Luhmann's writings open up fruitful avenues of analysis for STS scholars. In particular, it will be argued that too much emphasis has been given to Luhmann's definition of social systems as being self-organized, autonomous and closed. Even though all systems operate by means of structural differentiations enabling the simplification of communicative complexity, at the same time systems evolve in interaction with their environment, i.e., other systems. Luhmann's notion of structural coupling between systems is particularly relevant to this case of three, interrelated events of communication. From the point of view of uncoupled systems, the three ways of communicating the image mentioned above have very little to do with each other. Whereas the scientific communication only appears to have an interest in arriving at the truth of the matter, that is, finding out whether the image really depicts subatomic features or not, the journalistic and artistic communication are better understood in terms of the newsworthiness and aesthetic qualities of the image, respectively. However, this paper not only situates the three communicative events in terms of the functionally differentiated systems of science, science journalism, and art, but also looks at communicative couplings and interferences. The newspaper's communication of the image interacts with the scientific communication in terms of seeking (public) attention. Richter's artistic appropriation of the image highlights the paradoxical nature of observation and emphasizes the specialized codes of communication used by scientists and by journalists. This analysis provided by this paper suggests ways in which to approach the entanglement of scientific, journalistic, and artistic communication.

Constructing a non-hegemonic, interactive space for traditional Asian medicine. *Rey Calingo Tiquia, The University of Melbourne*

Historically, there has not been any meaningful two-way communication between science and traditional medicine(s), not to mention between science and traditional Asian medicine(s). The cultures and language of Western science and biomedicine are displacing the traditional language and culture of various Asian traditional medicine(s) including traditional Chinese Medicine (TCM) . The traditional epistemology of these ancient bodies of medical knowledge is being 'displaced' by the Trojan horse of science i.e. by the universal theories of objectivity, rationality, replicability, RCT (randomized controlled trials). And this situation is equally true here in contemporary Australia vis-à-vis the relationship between biomedicine and Complementary and Alternative Medical (CAM) traditions which encompass Asian traditional medicine(s) such as TCM, Ayurvedic medicine, Australian aboriginal healing traditions and the Japanese healing traditions of Shiatsu and Kanpo. While TCM (traditional Chinese medicine) a non-European and non-scientific Asian medical tradition finds its own place in this continuously changing globalised world , for more than half a millennium it has suffered the fate of being translated (displaced) by the hegemony of science and its kissing cousin, Western biomedical science. I call this type of translation 'hegemonic scientific translation' which places TCM, the 'guest' language within the universal frames of modernity, objectivity, rationality and scientificity. This means, paraphrasing Bruno Latour's definition of a geometric sense of translation, at once offering a universal interpretation of all the interests of all knowledge systems including TCM, and chanelling them in one universal direction. How should practitioners of Asian medicine(s) communicate with Mr Science ? Should we abandon science? Should we repudiate it? Should we use its language? Or, should we become Mr. Science. Using the theoretical framework of science and technology studies (STS), this paper will attempt to answer these questions.

A possible reformation of science communication with the aid of philosophy of science. *Masahiro Matsuo, Hokkaido University*

WWViews on global warming conferences were held last year, and now the views then expressed and adopted are being analyzed or summarized, while the way the conferences were conducted is carefully examined through the analyses of what coordinators individually experienced there. Undoubtedly, this kind of movements which attempt to involve citizens more deeply in social decision-making are becoming indispensable, particularly when the decisions about science and technology are likely to have deep impacts on our lives and future generations', like decisions concerning global warming. And the analyses of actual practices by the means of social sciences should be accumulated. However, I feel some doubt that the basic assumption underlying this kind of attempts is well grounded: that is, the assumption that on one hand, the communication between citizens and scientists should be promoted so the citizens can form their own opinions about critical issues, based on some basic information supplied by scientists (in this sense, communications between them consist in adjusting the explanation of researches to the needs of citizens), but on the other hand, scientists should keep their research away from all the interventional communications but those among peers expected to promote their researches. (Science should be autonomous!) Then there are two types of communications in so-called 'science communications' (now the role of policy-makers is put aside): one is a communication as a knowledge-adjusting process, and the other is an inter-peer communication for acquiring new knowledge. What I put into a question here is whether the two alone are the only necessary sub-communications for a total science communication between them. When we focus on reflectively enough, how the knowledge of science is conveyed with some modification to citizens, the point I make may be noticed. The thing is that this process will almost always be accompanied by the evaluation of uncertainties of research results by scientists. Scientists are no doubt experts on how to handle the uncertainties they usually face in their daily scientific conducts. But we should note that the information about uncertainties brought to citizens is relative to the type of method scientists take in each case, and that this relativity is almost always out of citizens' sight. Moreover, scientists are not necessarily conscious of this relativistic problem. If science communication consists in sharing as 'neutral' information as possible, this relativity should be placed as one of the necessary factors in citizens' evaluation processes. Unfortunately this doesn't seem to find its own place under the assumption mentioned above. So another communication is needed, which could realize this phase in science communication. Recently some group of philosophy of science is trying to take part in making this phase, particularly in the field of global warming science. This kind of new philosophical approach seems to play an essential role in the reformation of science communication. Referring to this attempt, I'll take WWViews for example, and consider how the communication there could have been improved with this kind of aid, maily from philosophical point of view.

The Role of Filipino Research Culture in Enhancing Science Communication and Collaboration. *Inez Zamora Ponce de Leon, Purdue University*; *Mark A Tucker, Purdue University*

Theories on the nature of science have implications for how scientists think and operate. For instance, Popper's falsificationism implies that facts can never be proven true; while Kuhn sees science as a series of paradigms that govern scientific work, but which can be changed. These theories also apply to the research culture, which consists of researchers' beliefs, values, rewards, sanctions, and norms. A more complete understanding

of the research culture can foster stronger collaboration among scientists, inform science communication theory, and contribute to more effective science communication. The Philippines is a hotbed of both biodiversity and research. Laboratories such as the US National Institutes of Health have long collaborated with Filipino researchers. However, very little research has been done on the Filipino research culture. Such information could help strengthen collaboration and science communication efforts, and could contribute to theories in both science communication and the nature of science. In this study, we conducted semi-structured interviews with 20 PhD-level researchers who worked in the Philippines, from fields such as biochemistry, genetics, and engineering. We asked them about their views on the scientific discipline and science communication. These interviews were transcribed, and a typological examination was carried out to search for statements fitting the elements of culture. The participants found it difficult to explicitly disclose details about their culture, but their interviews still provided information on the cultures in which they operated. They put faith in facts, and believed that non-scientists would support science and think "logically" only if they knew the facts. The participants looked down on dishonesty, the inability to publish, predictions, speculations, biased investigation, haphazard research, lack of transparency, and lack of passion for scientific work. While participants did not specify legal sanctions for ethical lapses, they believed that there were life-threatening consequences for the lay public. The participants also provided accounts of the scientific culture that they worked in. Research often took a back seat to teaching. Funding agencies often demanded that research projects yield commercially viable products within a few years' time, leading to a dearth in basic research. Participants described some of their peer researchers as unassertive and sensitive to criticism. Competition among laboratories led to secrecy and redundancy in research work. Filipino researchers were adaptable: They could shift research interests or improvise methods to fit funding without compromising the integrity of their results. While some of the participants described themselves as not being religious, they acknowledged that religion was a personal choice. For some, science actually reinforced their religious beliefs. These findings can inform science communication theory, better collaborative work, and science funding policy in the country as they provide a stepping stone to understanding researchers. These findings contribute to the STS literature by describing a unique scientific culture, and how key cultural elements can influence science communication and collaboration. The methods used may also offer other researchers the means to explore the unique scientific cultures in other contexts

Videos of a "sun miracle": What do they mediate? *Jan Palecek, Masaryk University*

As Bruno Latour suggests, there are two modes of representation. One, typical for science, is mediation of information about "out there" reality through reference chains. In second which Latour associates, among others, with medieval religious iconography, it is not the reality beyond the representation what is mediated. In this mode the visual representation (e.g. a medieval fresco) redirects attention of the viewer to the presence, to his or her own life, to understand the old God's message anew. In my paper I will discuss more recent visual representations - videos, and a specific case in which they are used in religious life. In its popular usage, video is a medium strongly connected with the scientific mode of representation: it is supposed to mediate a distant reality as it is (or was)". Videos I'm going to discuss are videos of special events: they are short movies taken at a well known Virgin Mary apparition site in Medjugorje, Bosnia and Herzegovina, and allegedly picture the "miracle of sun". Since the Marian apparition in Fatima in 1917 the miracle of sun has been part of the catholic religious tradition: thousands of people gathered were astonished by witnessing strange moves and transformations of the sun in the day sky. Similar phenomenon has been reported to appear at many later Marian apparition sites. Today, the blinking and pulsating sun recorded on videotape is made public on YouTube for those who have never seen it. I will analyze how these videos are debated in related internet discussions. What is being discussed, doubted or argued for, is often the videotapes' accuracy: do they really represent the moving sun? Isn't it a fake? Isn't it an optical illusion? Isn't it some naturally caused phenomenon? But there is also another way the videos are handled, and with other consequences. In association with some other arguments or objects a video may become less permeable, it may return the attention of viewers into the presence, it can make them pray and praise the God. I want to show thus, that mediation of the presence in part of current religious representational practice is achieved - perhaps surprisingly - by the means of a videotape, this popular version of scientific mode of representation. Even more, it is precisely videos' very ability to represent the "out there", absent reality of the "sun miracle" accurately that can help to mediate the life in the presence of God.

121. Science Journalism

9:00 to 10:30 am

5: 522

Participants:

Reporting in the future tense: challenges and potential for science journalism in a promissory bio-knowledge economy. *Heather Walmsley, Concordia University*; *David M. Secko, Concordia University*

'Public engagement' and 'public participation' in the development, critique and governance of emerging technologies is all the rage. Stem cells, genetic screening, GM crops, human tissue banking, bioenergy, biofuels: such issues are increasingly the focus of staged public debate. The current scholarly focus upon face-to-face consultative forums such as citizen juries, consensus conferences and deliberative consultations is, however, leading to the neglect of existing mediated public engagement forms. This inter-disciplinary paper addresses this oversight, drawing from research on the Genome Canada and Genome Quebec-funded Genozymes project at Concordia University. It considers potential future roles for science journalism in facilitating enhanced public engagement with, and critical witnessing of, emerging biotechnologies. The paper proceeds through three stages. We begin by reviewing the journalism studies literature to identify overarching norms, models, principles and political-economic factors influencing the construction and practise of contemporary science journalism internationally - from the 'compression' of relations between digital journalist and audience (Weiss and Joyce 2009) to innovations in public journalism (Rosen 1999) and participatory journalism (Domingo et al. 2008). Secondly, we draw from recent Science and Technology Studies scholarship to identify a number of key challenges posed by the 'tangled' (Latour 2004) sociotechnical objects of contemporary biotechnology to the possibility of critical witnessing based upon existing journalistic norms. These range from changing biosocialities (Rose 2007) to the promissory nature of the international bio-knowledge economy (Fortun 2008). Finally, we focus on this latter challenge of promissory 'truth' and knowledge, to argue for a re-imagining of journalism's relationship to democracy, a re-imagining of journalistic conventions of objectivity, evidence and credibility, and a re-imagining of potential story forms. Domingo, D., T. Quandt, A. Heinonen, S. Paulussen, J. Singer, and M. Vujnovic. 2008. Participatory Journalism Practises in the Media and Beyond. Journalism Practice 2(3):326-342. Fortun, M. 2008. Promising Genomics: Iceland and DeCODE Genetics In a World of Speculation. . Berkeley: University of California Press. Latour, B. 2004. Politics of Nature: How to bring the sciences into democracy. Cambridge, MA: Harvard University Press. Rose, N. 2007. The Politics of Life Itself: Biomedicine, Power and Subjectivity in the Twenty-First Century. Princeton: Princeton University Press Rosen, J. 1999. What are Journalists For? New Haven: Yale University Press. Weiss, A. S., and V. d. M. H. Joyce. 2009. Compressed dimensions in digital media occupations: Journalists in transformation. Journalism 10(587).

To Trust or Distrust? The Role of Weather Forecasting in Typhoon Morakot. *Shulin Chiang, Chinese Culture University*

This paper explores how the social relation between scientists and society is represented in Taiwanese newspapers during the period of Typhoon Morakot attacking Taiwan in August 2009. It unveils the paradox that the lay persons either distrust or over trust the weather forecasting. On one hand, the public ignored the warning by weather forecasters prior to Typhoon Morakot, as a result of distrusting the experts and lack of knowledge on interpreting the forecasting data. On the other hand, the government blamed the weather forecasters for their incorrect predictions after the disaster took place and caused huge loss of wealth and lives, which seems to over trust the forecasting. This paradox presents as an interesting case to investigate the public perceptions of the uncertainty of weather forecasting, as well as the ambivalence of lay persons held to the weather forecasting when the big storm hit Taiwan. Typhoon Morakot was one of the worst natural disasters to hit Taiwan in the last 50 years, reporting at least 650 deaths, 7,000 homeless and $ 1.5 billion in damage. Swelling rivers washed away bridges and spurring landslides buried an entire village. When addressing the increasing anger from the public, the President of Taiwan, Mr. Ma Ying-jeou, accused the national weather bureau of falling to predict rainfall that soaked some parts of the country. The government's investigation arm, the Control Yuan, inquired whether the national weather bureau had a role in the extent of devastation. However, voices from professionals and academics stood out in defense of weather forecasters, arguing that the weather forecasting has its limits in prediction which stems from the uncertainty of science. In this event, newspapers acted as a public arena and aggregated voices from different actors expressing their opinions on the so-called 'inefficient warning of weather forecasting'. Methodologically, this research collected data from major newspapers in Taiwan, including the United Daily News, the United Evening News, the China Times and the Liberty Times during the period of August and September 2009. Keywords 'Typhoon Morakot' and '88 Flood' were used for searching related news stories. Apart from the data collected during these two months when the disaster took place, the subsequent relevant reports, e.g. critique/blaming/responsibility claiming from the public and the government, were also included in this research. In addition, reports from foreign news agencies, e.g. The New York Times was also included as a reference to this analysis because it has made some comments on the responses by the government. Theoretically, it is hoped that this research would contribute to the existing literature on the relations between scientists and society, e.g. trust; people's understanding of science; and the uncertainty of science from the lens of Science and Technology Studies. It also aims to contribute to the literature on disaster research. Additionally, this research will provide some suggestions for the forecasting professionals, e.g. make the forecasting understandable for lay persons, as well as for the government when making disaster management policy in the future.

Health research in Latin American newspapers coverage. Quantitative indicators. *Carmelo Polino, Centro REDES*

In academic an cientific informal forums the idea prevails that S&T are not given press coverage; or that, when they do, is more an anomalous fact outside of the news agenda. In the same manner, there predominates the belief that agenda of the media, when it touches S&T topics, is to offer coverage from industrialized countries. It is generally highlighted that research produced by local scientific institutions is practically ignored. The problem is that it is not an easy task to evaluate these perceptions, due to the fact that, so far, there have been basically no regional academic studies, and hence there are few systematic studies and little adequate empirical evidence available. This presentation tends to be a contribution towards filling the informational void on this matter son that the dominant belief can be put into perspective. It will outline quantitative results from newspapers coverage on health R&D in Argentina, Brazil, Colombia and Costa Rica. Using the "constructed week" methodology, comparative indicators will be shown to appreciate the level of attention that media invests in these topics, as well as the temporal distribution and frequency of reports on local research, in relation to that proceeding from overseas. The results indicate that, contrary to the "established perception", R&D (in fact, S&T issues in general), are part of the media routine agenda. In addition, the empirical evidence urgues us to reevaluate the harsh judgment regarding the scarcity of local news production. It seems to be true that in some newspapers the science done in more advanced countries is giving a more leading role, but under no circumstance can this picture be generalized. On the contrary, other newspapers have a clear orientation towards national R&D.

Research promotions by research institutes and by scientific communities in Japan. *Fuji Nagami, Tohoku Neuroscience Global COE, Tohoku University*

One of the major works of the public relation section at the research institutes is issuing the press releases about the novel research achievements published on major academic journals. In Japan, these releases are mainly addressed to mass media especially for newspapers which have specific sectors for science and technology, and the quantities of articles appeared on the newspapers sometimes have a power to persuade bureaucrats for researchers' activities to attain the budgets. Japanese research communities have their own academic journals and annual meetings but rarely have their own function for the media communication in daily activities. Meanwhile, since the university reform in 2004 that convert national universities into independent corporate entities, the importance of public relations units in the organizations becomes larger and larger. Some universities employed specialists in charge of public relations to reinforce the function, especially for the issuing the press releases. As a result, the newspaper articles about scientific research progress have been made mainly based on press releases by research institutes. The situation above mentioned has caused some difficulties. First, some research institutes, especially for regional universities, cannot have the public relations sections and issue press releases on the research progress because they do not have enough resources to do such tasks. Second, each public relation sections of research institutes have propensities for exaggeration about their own results; mass media cannot have scales to compare the importance of each result. Third, nonetheless the size and quantities of articles treating the research progress do not reflect the value of research itself, the research budget can be influenced by that. Finally those situation works to expand the gap between large wealthy institutes and small poor institutes. Here we report the real figures of public relations activities at research institutes, how the specially appointed officers for the work were employed, the effects of that on the coverage by media, and the influence on the newspaper article contents by the press releases described by specialists. As mentioned above, we think that the enhancements of the public relation section at the research institutes have not only the positive impacts on the institutes but negative ones on the whole research communities. Research promotion activities by each research institutes put the stress on each institutes contributions to the research progress and do not care much about the values of the research results in the whole research area. In some foreign countries, most research communities have public relations functions, and they make their own press releases from their points of views. The new coverage on science and technology should be established on the good balance of both research promotion functions by institutes and by research communities. We overview the situation of research communities function in Japan and discuss the achievements of ideal balance for the research promotion activities.

122. Portrait of the ARTist: Cross-cultural constructions of 'woman' in the context of assisted reproduction

9:00 to 10:30 am

5: 524

Reproductive technologies push the envelope of existing discourse,

requiring new definitions of kinship, and new subjectivities to accurately represent the issues raised. Embedded within this discourse, however, is a larger, long-unresolved paradox in the simultaneous construction of reproductive service users as patient and as consumer; a tension which has been further complicated by the emergence of a globalized reproductive market in which gametes, embryos and even wombs are bartered, borrowed and sold. While theorists have wrestled with the meanings and regulatory dilemmas of concepts such as 'mother', 'father', 'life' and 'choice', and scientists in the fields of gene therapy and regenerative medicine have become increasingly dependent upon human ova for the technologies they seek to perfect, the discourse of reproductive and genetic technologies relies increasingly on compartmentalization, separating the woman as knowing-subject from her constituent body parts, and leaving her largely outside the frame of debate. This panel presents an international selection of papers which explore similarities and differences in the construction of women within the discourse of assisted reproductive technology (ART) emanating from different political and cultural contexts. The papers examine issues arising in Australia, India, Israel, the UK and the US, and focus on questions as diverse as how ART has affected the category of 'woman'; her location in public debate; the development of biomedical expertise amongst anti-ART activists; reasons and motivations behind women's actions and physicians' practices in ART treatment; the place of power and religion in the decision to undergo ART; and the use of surrogates in the developing world. Although practice and regulation varies from nation to nation, the borderless nature of the reproductive market demands a globalized understanding of the discourses surrounding ART. In particular, STS requires a more sophisticated understanding of the gendered impact of processes such as egg extraction, which form the basis of other controversial technologies such as stem cell medicine, pre-implantation genetic diagnosis, and gene therapy, in order to fully analyse their social implications. The Panel extends the current STS literature in reproductive technologies, working from the foundations of feminist scholarship, medical anthropology, and social movements theory, bringing a new consideration of global influences and contexts, and a shift from technology-centered to woman-centered discourse. Through this we aim to uncover patterns that can lead to a greater understanding of the differential impact of these technologies upon the bodies of women in diverse geo-cultural contexts, and explore possibilities for returning the woman-subject to the center of the debate. Session organisers: Lea Ann Mawler, Virginia Tech, lmawler@gmail.com Stevienna de Saille, University of Leeds, igs5smds@leeds.ac.uk Additional panellists: Tsipy Ivry, University of Haifa, tsipy.ivry@gmail.com Karen Foss, University of New Mexico, Karen.Foss@comcast.net

Participants:

Motivation and Fertility: Physician and Patient Pursuit of Pregnancy and Birth at All Costs. *Lea Ann Mawler, Virginia Tech*

In the United States, there is a strong conception that Assisted Reproductive Technologies are a response to a rise in infertility that is in large part tied to delayed childbearing. Further there is an assumption that it is desperation to have children that drives patients toward extreme treatments and the patients' desperation that drives doctors and researchers to develop new technologies, despite risk to the mother and any potential child or children. Further the media often simplifies the ethical questions regarding ARTs to informed consent - if the patient were properly informed, everything would be fine. In this deficit view, the individual woman, her health needs, her desires, and her actual personal story are often subsumed by the cultural archetype of the woman, driven by the biological desire to have children, being desperate enough to try anything to get a ("biological") child, and the doctors as driven by the desperation they see in patients to develop the treatments in question. In my paper, I seek to unpack the motivations for both doctor and patient, going beyond the superficial label of desperation and uncovering other factors such as patriarchal, heterosexual norms and gender conformity. Importantly, from the perspective of the development of the treatments, I will shed light on the focus on the symptom of involuntary childlessness versus treatment for an underlying disease or cause. The primary focus of the paper will be analysis of printed materials. The media have covered the rise of infertility and the personal stories of 'desperation' of many would-be parents, and the media play a critical role in uncovering the cultural positioning of infertility and fertility treatments. In order, though, to determine motivations without the filter of the media, internal newsletters and correspondence of support organizations for infertile people will also be considered. Finally, the motivations of the physicians who develop and administer treatments that could cause harm to their patients and their potential offspring are key. In order to consider physician motivations, I will analyze internal correspondence, like the members-only newsletters of key professional associations of practitioners.

No view of woman from the neo-liberal womb?: Resistance to ART in the UK and Australia. *Stevienna de Saille, University of Leeds*

A woman-centered analysis is capable of providing persuasive argument for either side of the debate around the use and regulation of ART, yet the discourse around reproductive and genetic technologies remains steeped either in the language of religious and economic concerns, or in the rights-based language of the "best interests of the child". Even where unacceptable risk to women's health provides the strongest argument in favour of a contested technology (such as the creation of hybrid embryos for stem cell research recently debated in the UK) woman-as-subject rarely appears within the discursive frame. In the West, the cry of "women want it" combines with the neo-liberal agenda of free-market economics; this complicates activist efforts to frame their concerns about the technologies used to extract the "raw materials" for biomedical research and frequently alienates women who wish to use these same technologies to create a child. Meanwhile, protest regarding the impact of a globalised ART market on women in poorer nations remains largely unheard. While analysis of the various arguments may reveal the discursive strategies used by feminist activists to try to keep the woman within the frame of the debate, this cannot theorise the unique difficulties of mobilising to fight science with science. Effective lay engagement with biomedical issues requires a level of techoscientific expertise substantially different from that needed to engage in the identity movements of the post-war period upon which most social movements theory is based. How activists develop this expertise has largely remained a black box in both studies of collective social action and the narratives of scientific controversy more common to STS. This presentation draws from a case study of the Feminist International Network of Resistance to Reproductive and Genetic Engineering (FINRRAGE), a radical feminist organisation which encompassed over a thousand women in thirty-seven countries at its height between 1985 and 1992. Documentary analysis, supplemented by oral history interviews with FINRRAGE activists in the UK and Australia, will be used to compare and contrast the success of these two chapters in keeping the woman-subject within the frame during the key phase of regulatory debate over the use and provision of ART services and avenues of research. Through this, I will show how concepts drawn from the sociology of scientific knowledge, particularly Collins' work on interactional expertise, may be combined with the traditional concerns of social movement theory in order to create an analytic framework through which we may begin to understand the role of expertise in collective action. The goal is to demonstrate a generalized framework which will be mutually intelligible to STS scholars and to social movement theorists, particularly those studying health and environmental social movements, as well as to further feminist scholarship on biomedical ethics, science policy, and public engagement with science.

Religious Jewish Women's Health and Agency in "Kosher" Fertility Treatments. *Tsipy Ivry, University of Haifa*

Whereas in recent scholarly works in the anthropology of ARTs around the globe religion often emerges as a belief system that doctors must become familiar with in order to communicate with patients, the present work emphasizes the consequences of a politics of authoritative knowledge that Jewish rabbis introduce into medical care on the health and agency of religious Jewish

women undergoing fertility treatments in Israel. Rabbinical interventions into medical care in general, and fertility care in particular, have become most common in Israeli health care during the last 15 years. More rabbis become increasingly acquainted with medical language and knowledge and have mapped the network of medical professionals and medical facilities that offer fertility treatments. Rabbis do not hesitate to intervene in medical decisions on behalf of their followers to demand that the course of treatment be modified according to the restrictions of Jewish law. However, interventions occur regardless of halachic problems. On the basis of their medical understanding, rabbis refer patients to other courses of medical treatment not offered by their doctors in order to maximize success rates. The koshering of medical care and the power relations that it brings into the clinical encounter cannot be fully grasped without paying heed to the interconnected processes that come as part and parcel of the adaptation of biomedical knowledge by religious scholars: the emergence of a combined medico-rabbinic authority structure that uses biomedical knowledge to fortify religious authority, and the medicalization of rabbinic law - a growing tendency to think of medical interventions as imperative to observing God's commandments. Based on three years of fieldwork with an Israeli organization of orthodox-Zionist rabbis who offer halachic mediation services to religious Jewish fertility patients, and 60 in-depth interviews with fertility experts and patients, I argue that the rabbis involvement creates a triadic structural doctor -rabbi - patient relational model with complex implications for decision-making, style of medical treatment and women's health. For some patients, the Rabbi's involvement becomes a source of empowerment. However, some patients find themselves trapped within a non-collaborative relationship between doctor and rabbi. The dynamic that emerges is of uneasy mutual rabbi-doctor dependence within which doctors and rabbis appropriate each other's forms of authoritative knowledge and language to exert power on patients as well as on each other, refer patients to and fro strategically, and often cross each others' professional boundaries and red lines. Within this interlocking nexus of power women may find themselves subjected to invasive medical procedures - numerous IVF treatments, and even hormonal treatments to counter infertility caused by ritual abstinence - under the full approval of rabbinical authorities with little discussion of the effects of these procedures on their health. Thus religious Jewish women today can receive halachic permissions to use "kosher" fertility treatments under the direct halachic supervision of rabbinical authorities, they can even receive spiritual support, but very few exemptions from engaging in the painful ordeals of ARTs.

Goddesses, Monsters, Heroes, and Villains: Rhetorical constructions of surrogacy in India. *Charlotte Kroløkke, University of Southern Denmark*; *Karen A Foss, University of New Mexico*; *Saumya Pant, University of New Mexico*; *Jennifer Sandoval, University of New Mexico*; *Karen Hvidtfeldt Madsen, University of Southern Denmark*

Feminist scholarship is ripe with tension and contradictions. How do we understand motherhood when the rental of one woman's womb is intended to make another woman a mother? This paper will engage the current feminist debate on ART by presenting a rhetorical analysis of the constructions of surrogacy as it unfolds in interviews with Indian clinic directors, health officials, surrogates, and international patients at select Indian fertility clinics. The paper takes as its point of departure a visit to three fertility clinics in Mumbai and a visit to the Akanksha infertility and IVF clinic, located in Anand, India, all undertaken during December 2009. First, however, we wish to outline current feminist theoretical debates on the topic (Inhorn, 2009, 2002; Kroløkke, 2009; Lay et al, 2000; Layne, 1999; Mamo, 2007; Markens, 2007; Ragoné, 1994, 2000; Raymond, 1993; Spar, 2006, Thompson, 2005). Two key questions, related to reproductive care without borders, emerge out of this literature: Is cross-border reproductive care best understood in light of the plight of the infertile couple, and thus, as a form of reproductive exile? Or can we engage the larger commercial framework without also seeing it as a form of reproductive trafficking (trafficking in eggs, wombs, and babies). Briefly, while some feminist scholars note that new reproductive technologies challenge conventional understandings of gender and the family, others point to the reinstatement of imperialist and patriarchal practices. New reproductive technologies deconstruct, according to the proponents, essentialist notions of maternity. Commercial transactions sidestep the nuclear (heterosexual) family as well as moralistic discourses by permitting single or gay individuals to become parents and in the process, allowing new family constellations to emerge. In sharp contrast, others note that adoptions, surrogacy, and egg donation for example, spring out of economic despair rather than self-determination. In the process, colonial practices are rearticulated and the old colonies become the new breeding grounds for white, privileged families—what Ginsburg and Rapp (1995) call "stratified reproduction"—transnational inequities reappear as a result. Our paper contributes to the existing STS and feminist literature by adding an empirically driven study to an emergent issue within transnational reproductive care practices. While we are inspired by some of the more philosophical literature within STS and feminist studies, we believe that an empirical study including interviews with both health officials, clinic directors, patients, and surrogates serve to complicate our analyses in interesting and unexpected ways. Consequently, in our paper we conclude that multiple and shifting rhetorical positions appear—ranging from goddesses, monsters to heroes and villains. Our paper highlights the importance of studying these new reproductive practices from non-Western perspectives.

Between Hope and Fear: Women's Narratives of Assisted Reproductive Technologies in Turkey. *Burcu Mutlu, Istanbul Sehir University*

The paper will focus on the complex relationship between women and assisted reproductive technologies in Turkey through women's narratives of In Vitro Fertilization (IVF). Rather than taking IVF as an independent technology as such, the paper will attempt to provide a social analysis of this complex phenomenon of reproductive technology in Turkey, based upon the interviews that were conducted between 2007 and 2008 with women who underwent IVF in different IVF clinics in Istanbul, Turkey.
As science and technology studies underscore, the discourses and practices of biomedicine and technology are played out on a complex cultural ground.In other words, technology itself is a highly contested cultural object, producing its own diverse social constructions, uses and exclusions. In order to highlight the complex cultural ground on which one more aspect of women's lives becomes more medicalized with the practice of IVF, Bruno Latour's terms of "purification" and "hybridization" will be employed as the analytical tools for this analysis. However, Latour's theoretical framework does not show us how the practices of purification and hybridization are working within the power relations of a given society. By moving the Latourian framework further, a more "politicized" conceptualization of this "double movement" of purification and hybridization will be used, which is closely linked to the very process of how power relations are configured within a given society. Following a "politicized" Latourian perspective, it will be argued that IVF offers a fertile ground for examining the making of these boundaries and their interconnections in terms of the socio-political implications of the relation between IVF technology and women by drawing on the women's narratives of IVF. They reveal the complex ways in which IVF as a technology and process is understood by women in their engagement with this technology. Throughout the paper, by drawing on the women's narratives of IVF, the discourse of hope surrounding the world of IVF will be problematized. Although through hope discourse, IVF is represented as a miracle treatment for "infertile" couples, the women's narratives of IVF reveal quite different picture of IVF. In the paper it will be claimed that women's narratives shed light on the ignored aspects of their IVF experiences, specifically by addressing the paradoxes of IVF and the strategies women develop to cope with them. Their narratives

will imply how the discrepancy between the hope offered by IVF and the complex nature of IVF reality is managed. Providing such social analysis of IVF in the local context of Turkey, the paper will aim to contribute to social studies of science in non-western contexts.

Chair:

Lea Ann Mawler, Virginia Tech

Presenting Authors:

Lea Ann Mawler, Virginia Tech
Stevienna de Saille, University of Leeds
Tsipy Ivry, University of Haifa
Karen A Foss, University of New Mexico

123. Local and Shared Knowledges at the Intersection of Science, Technology and Environment

9:00 to 10:30 am
5: 531

Summary Due largely to scientific uncertainty and the ongoing failure of prevailing expert-led approaches based on technocratic discourses and solutions, environmental governance and policy development require renewed attention to new practices, institutions, networks and public engagement strategies to better manage risk and uncertainty. Democratic legitimacy and social cohesion are vital components of the contemporary shift to integrated natural resource and environmental management, and the allied promise of more sustainable environmental and social outcomes. This session will explore public knowledge and participatory strategies for engaging publics in science and technology innovation and governance, and the understandings that inform those strategies, in a comparative regional context of countries in the Asia-Pacific. The papers from Australia, Singapore and Taiwan provide insights for policy learning and development across jurisdictional boundaries; for adaptive strategic responses across multi-domains and levels; and for engagement with multiple actors directed at system innovation and improvement. The utility of the comparative approach adopted here is a point emphasized in the policy learning literature. A policy learning perspective aims to understand how, under the impact of globalisation, policymakers are increasingly seeking knowledge and ideas about what institutions, programs and policies might work 'in-between' jurisdictional boundaries, and especially across jurisdictions with similar political and legislative contexts. Rationale Unique and complex science and technology issues have created formidable social environmental challenges for the future, which beg a different approach; a participatory approach that is becoming highly popular in the current literature on how to best resolve the big environmental problems, and that is also popular in emergent practice in both formal governmental and more informal public sphere domains. Natural resource management, climate change and renewable/clean energy exhibit a number of convergent themes in practice and policy development, and thus provide excellent case studies through which to explore issues at the intersection of several conference themes—namely (A) environmental studies, (I) public engagement/social movement, and (K) science, technology, and public policy. The Asia-Pacific setting also provides novel insights in a region where, so far, only limited comparative studies are evident. This session thus covers new and important ground. Contribution to STS This session contributes to a key STS issue: science and technology governance in relation to environmental management and policy at a time when the ground rules that connect citizens to the state are up for revision and reformulation, and when enhanced engagement with local and shared knowledges for addressing the big environmental questions of our time is becoming increasingly popularised. This session contributes especially to Asia-Pacific STS scholarship and regional policy learning in this regard, highlighting diverse cultures and socio-political contexts for broader policy learning and development to address seminal issues at the interface of science, technology and the environment.

Participants:

Shared Knowledge for Shared Responsibility? Civic Epistemology and the New Political Spaces of Environmental Governance in Australia. *Tabatha Wallington, CSIRO Sustainable Ecosystems*; *Cathy Robinson, CSIRO Sustainable Ecosystems*; *Bruce Taylor, CSIRO Sustainable Ecosystems*

The new political spaces created by community-based natural resource management in Australia have transformed the way in which institutional order and public knowledge are co-produced. In this radical policy experiment, agricultural production and environmental conservation agendas are now intimately linked, and the ground rules that connect citizens to the state have been substantially revised. Drawing on the concept of 'shared responsibility' developed by Wallington and Lawrence (2008), this paper examines how these emerging governance dynamics are manifest in institutional rules and norms both to adjudicate different knowledge claims, and to handle the hybrid knowledge produced through alliances between the diverse actors brought together in the creation of 'publics' for environmental decision-making. Drawing on a three-year study of community-based natural resource management in the Tropical Savanna regions of northern Australia, this paper examines the nexus between knowledge co-production and shared responsibility. We show that the new arrangements formally recognise the value of enhanced public engagement, the utilisation of local knowledge, and a deliberative approach to planning. However, interviews with planners involved in mediating the generation and translation of environmental knowledge highlight the reality of an ongoing tension between scientific and local knowledge claims in the framing and monitoring of environmental action. We argue that under conditions of radical uncertainty, policy regimes need to be more open to the diversity of problem framings and knowledge bases on which shared responsibility depends. Analysis of the empirical relationship between shared knowledge and shared responsibility is assisted by drawing on two resources: John Dewey's pragmatist theory of inquiry, and the concept of 'civic epistemology' articulated by Sheila Jasanoff. The focus on knowledge 'practices' in pragmatist philosophy holds the potential to ground the understanding of shared responsibility in the properly social and dialogical nature of this vital political relationship. In turn, the public testing of knowledge claims intrinsic to civic epistemology provides a solid institutional grounding for the interrogation of such practices. Together, these resources provide a way to understand how public knowledge is generated, validated, used, negotiated and modified in the making of community-based plans for the sustainable management of natural resources in regional Australia.

Green Energy Localized: the Innovation of Local Knowledge in the Case of Micro Hydro Power System in Taiwan. *Hung-Jen Yang, National Yang-Ming University*

As an industrial backward country, Taiwan lags behind European countries, the United States, and Japan in terms of technology. Even so, is it possible that Taiwan can have its own unique technical innovation in the age of green energy, especially for environmental sustainability transitions, instead of merely relying on the transference of green energy technology? If the answer is positive, what are the characteristics of such technical innovation, specific to Taiwanese society? This paper focuses on the micro hydro power system, made by Cheng-Shi Liou, a unique innovation that has not been found in any other places. Mr. Liou's local green energy invention is based on the traditional irrigation system, an infrastructure constructed all over Taiwan. Mr. Liou is an inventor and entrepreneur par excellence, native to Taiwan and born in a typical rural area, Da-bei, Yuan-lin County. The only formal education that Mr. Liou received was elementary schooling. While he does not have high achievements in terms of degree, Mr. Liou obtains and even constructs a vast amount of local knowledge. Adopting the Actor Network Theory (ANT), the theory of social construction of technology (SCOT), and sociological analysis of the modernity in technology, this paper seeks to answer the following questions: how Mr. Liou's knowledge in engineering is formed, how the heterogeneous association between human and nonhuman is made, how Liou's innovation can exert its influence on the negotiation of green energy legislation, and how Liou's micro hydro power system contributes to an alternative mode of globalization, that is, the localization of green energy throughout East Asia, where rice-

growing paddy fields dominate the landscape. The localization of green energy, to which the micro hydro power system contributes, is characterized by the entanglements of the past and the future, the entrepreneur and the enterprise of the power company, micro innovation and macro legislation, localization and globalization. This paper hopes to envision a mode of "negotiating globalization", in a context of environmental sustainability transitions, which is neither pro-globalization nor anti-globalization, but which is made possible by local technical innovation in green energy.

Democratic Potentials of UN Climate Change Conference Host Government Websites? *Catherine Candano, National University of Singapore*

E-government discourse implicates state-produced websites to possess opportunities to enable spaces for citizens in policy issues, subject to demands to be inclusive, engaging, and free from commercial interests. Considering the global issue of climate change wherein policy-making takes place at the inter-governmental United Nations Climate Change Conference (UNCCC), it becomes critical to examine if and how the governments hosting this restricted policy-making space engage citizens on the global issue of global concern by way of their online presence via a host country conference outreach websites. Among the government-created UNCCC websites from 2007 to 2009, results topically indicated Danish Government's website possesses the most democratic potential, representing inclusivity for the inter-governmental process online. The presence-absence coding scheme for potentially democratic-website features was reconsidered as a preliminary than a primary analytical framework. Instead of highlighting increased opportunities to join conversations per se, it was found helpful to explore relational underpinnings between state-citizens and values privileged by designers using mixed methods. Therefore, topical presence of enhanced website features of the Danish government website possibly contributes to this potential, compared to previous government's online efforts; however findings have shown inherent design aspects of such interactive website may potentially shape the manner wherein climate conversations are limited in an assumed 'democratized' space online.

Getting to Zero: 100% Renewable Energy by 2020. *Adam Lucas, University of Wollongong*

There is mounting scientific evidence that unless humanity radically reduces its greenhouse gas (GHG) emissions to zero within the next two decades, there is an unacceptably high risk that it will trigger catastrophic, irreversible climate change. After decades of anthropogenic climate change denial, the world's largest GHG polluters, the fossil fuel and metals processing industries, have recently begun to argue that the technology to convert the world to zero emissions does not exist, and that even if it did, the cost of implementing such technology would wreck our economies and radically reduce our standards of living. Politicians of the left and right have been inclined to make similar arguments, and have consequently avoided any serious consideration of the policy and financial implications of rapidly achieving zero emissions. It has therefore been left to citizen-led research and action groups to develop the relevant knowledge and expertise. This paper introduces the STS community to the work of two affiliated NGOs originating in Melbourne, Australia, which have scoped the available technology, geographical locations, economic costs and social dynamics of moving Australia to 100% renewable energy by 2020, along with electrification of 80% of the country's current transport requirements. Not only does the technology already exist to achieve this, the cost of doing so is affordable and the relevant policy settings achievable. It is argued that STS scholars are uniquely placed to defend, promote and contribute to these and similar initiatives throughout the world, notwithstanding the 'agnostic' position on scientific and technological development promoted by some exponents of SSK.

Chair:

Tabatha Wallington, CSIRO Sustainable Ecosystems

124. Intermediaries in action 1: on intermediaries, brokers and go-betweens

9:00 to 10:30 am

5: 532

Today, the production of science and technology has changed beyond recognition. The outsourcing of technological development capability, the shift to market supply and the commodification of offerings has radically changed the terrain in which many technological activities occur. It opens up an organisational, indeed industrial, division of expert labour between supplier and vendor - facilitating specialisation but at the same time fostering a differentiation of perspectives (knowledge, priorities, culture) between developers and users. The STS research tradition emphasises the importance of tacit, experience based and local knowledge and the consequent difficulties of capturing, formalising and applying elsewhere such 'sticky knowledge' (von Hippel 1994). In this context STS places special stress upon the role of various kinds of intermediary (some linked to technology development, others to its appropriation), able to bridge between innovation locales - to collate local knowledge and sort it and transform it so that it can be applied elsewhere. The papers of this panel therefore seek to examine the people, institutions, and objects that move in-between different worlds. This means focusing on the spaces that privilege the translation and brokering of knowledge across boundaries: spin-offs, research councils, consultants, science shops, technology transfer offices, etc. On the other hand, intermediaries often arise at the interstices between organisations as an informal role (raising questions about how this role may be resourced and motivated). Within these formal and informal spaces a variety of social and material techniques are mobilised: organizing seminars or meetings, developing databases, producing plain-language booklets, creating common languages, deploying modes of argumentation, creating and drawing upon promises and expectations, developing business models and prototypes, etc. Importantly these techniques have to be adapted to the needs and expectations of the knowledge users, which might differ substantially. The idea of the session is to further sensitise STS scholars to the importance of various intermediaries that link the supply and use of science and technology, spanning locales and levels. Here are some of the questions that we seek to answer: - How do we identify the emergence of new kinds of intermediaries who help shape expectations about the development of technological fields and constitute markets for constantly changing supplier offerings? - What influences do intermediaries have on the developments of markets, new products, policies and ideas? - How is knowledge translated, reframed and transformed throughout these processes? - What are the typical devices and objects used by intermediaries? - What are the benefits, drawbacks and challenges of the peripheral or interstitial status of intermediaries? - What happens to intermediaries once the work they are asked to accomplish becomes normalized within a system? Do their interventions remain "outside" observations or does such work become embedded in the system? Papers by: - Liliana Doganova, Copenhagen Business School (ld.ioa@cbs.dk) - Arthur Mason, Arizona State University (arthur.mason@asu.edu) - Morgan Meyer, Mines ParisTech (morgan.meyer@mines-paristech.fr) - Neil Pollock, University of Edinburgh (neil.pollock@ed.ac.uk) - Matthias Wienroth and Matthew Kearnes (Matthias.Wienroth@durham.ac.uk, M.B.Kearnes@durham.ac.uk)

Participants:

The pragmatics of strategic translation: modes of argumentation in UK science policy. *Matthias Wienroth, Durham University*; *Matthew Kearnes, Durham University*

The development of research programmes in new and emerging science and technology (NEST) have become central sites for innovation in what is collectively referred to as 'science policy'. The development of such programmes is typically presented in promissory terms - as central to national interests and securing a range of societal benefits. In light of this, recent research has emphasised constitutive role that intermediary organisations play as translators between policy objectives and the research community (Braun and Guston 2003; Guston 2003; Meyer 2010; Shove 2003). We focus here on the role played by Royal Academies and UK Research Councils in the policy construction of fields such as nanoscale science and technology and synthetic biology. In this paper we develop a conception of the institutionally situated agency of research intermediaries to both

engage with and shape science policy negotiations. We suggest that science policy intermediaries operate as 'cultural translators' - strategically mobilising and deploying contemporary policy narratives and discourses. Through an analysis of the UK science policy constructions of nanotechnology and synthetic biology we focus on what Boltanski and Thévenot (2006) term 'modes of justification' deployed in the development of policy positions and interventions. By closely examining modes of argumentation employed by research councils and the royal academies in UK science policy negotiations regarding nanotechnology and synthetic biology we focus here on the strategies that such intermediaries employ in both selecting and deploying arguments in public policy, their capacity to develop coalitions with other bodies (Hajer 1995) and their flexibility in switching between arguments (Moody and Thévenot 2000). We conclude by suggesting that science policy intermediaries operate strategically by attempting to translate institutionally situated concerns into more generally applicable concepts of the public good (Gallo 2009). The capacity of intermediaries to successfully extend their situated interests from the particular to the general is constrained by a repertoire of available modes of argumentation in contemporary science policy discourse.

Moving in-between, alongside and away: a geography of knowledge brokering. *Morgan Meyer, Ecole des Mines de Paris - ParisTech*

Over the past two decades there has been a proliferation of knowledge brokers and spaces dedicated to knowledge brokering: science shops, technology transfer offices, knowledge brokering activities between research and healthcare, and so on and so forth. The human actors involved in these brokering processes are individuals who are constantly in movement. And it is by moving around that they accomplish their threefold task: distributing knowledge, translating and transforming knowledge and, finally, rendering knowledge more robust. The usual way of conceiving the movement and positioning of these knowledge brokers is to imagine them "in-between", to see them as occupying an interstitial space between two worlds. But brokers do not only move between two worlds. Their movements are much more varied, multidimensional and multifaceted. We detect at least four kinds of trajectories: first of all, the will and the work involved to engage in a brokering project (moving into), then, the moving between different worlds and the moving alongside actors and, finally, the detachment and getting away from these actors (moving away). Knowledge brokering is, in fact, based upon a very particular participative connection: a connection that is necessarily temporary, transient and flexible. I will also argue that knowledge brokering is both a place and a process. The knowledge broker is a conduit between two worlds and s/he shows the way towards a (new) world. But this future world has uncertain contours - one is never sure whether brokering interventions will be a success. A broker only ever accompanies people, encouraging them to learn, to change certain practices, to think differently. A broker will have to wait several years before being able to see whether his or her intermediations have had an impact and left some traces and whether the knowledge that was mobilised and transformed has been made "sticky".

Give Me a 2*2 Matrix and I Will Raise the Market: The Intermediaries and Devices that Create Product Categories. *Neil Pollock, University of Edinburgh*

There is apparently no more socially constructed category than the 'product category'. Technology vendors routinely promote and distinguish their offerings from those of their competitors and previous generations of products. This appears to be particularly the case in the software industry where, because of the lack of a physical product, product terminologies and classifications are constantly shifting. Between 1990 and 2002, for instance, vendors developed nearly 400 different concepts to describe their offerings (Pontikes, 2008). This is despite the fact that the actual differences between these variously named technologies remain amorphous. The complicated, ambiguous and often changing nature of product categories has not gone unnoticed by scholars within disciplines such as institutional theory, economic sociology and marketing. Rosa et al (1999), for instance, write that it is easy to forget that product categories are " nothing more that theoretical constructs, developed and agreed to by market actors to make sense of producer and consumer behaviours" (64, 1999; see also Rosa et al 2002). Modern product markets and how we define them, they argue, are no longer as "constrained by time or place but instead are agreed-on loci of transactions with few if any physical markers" (my emphasis, 64, 1999). However, we wish to query the specific mechanisms identified. For instance, to simply identify product categories as 'social constructions' fails to appreciate the material processes also involved in their production, reproduction and use. Product categories are very much a 'socio-technical' phenomenon. With this article, we join with the recent growth in interest by sociologists of science and technology in the material production of markets (Callon 1998, 2007; Mackenzie 2006, 2009). Here it has been persuasively shown how 'devices' make markets possible (Callon 1998, Muniesa et al, 2007). We investigate the role of a group of intermediary experts (the industry analyst known as the Gartner Group) and their production of a simple ranking device called the 'magic quadrant' (Pollock & Williams 2009). Our contribution is to show how this material device provides both 'constraints' and, adopting Gibson's (1977) term, 'affordances', for these market intermediaries. In particular, we show how the material constraints of the tool force its authors to continuously update and reconfigure their conception of the market (in particular through generating new product categories). To say this in different words, the tool demands that its authors configure the market in ways that were not originally anticipated. The wider aims of the paper are twofold: firstly, to give impetus to social scientists in understanding how highly simple devices like these have virtues in 'performing' marketplaces; secondly, to point to the enormous growth in dedicated intermediaries (experts and professionals, organizations and bodies) that are not solely reporting on the qualities of product categories but are creating those classifications.

Cartel Consciousness and Horizontal Integration in Energy Industry. *Arthur Mason, Arizona State University*

Since the 1980s, energy market restructuring has increasingly privatized market risk to a point where it is now difficult to synchronize the long-term horizon of energy production with the short-term fluctuations of energy price. This shift from regulation to competition has intensified the special character of interrelated values of oil and natural gas. The hierarchy of meanings, for example, in developing new supply sources has been reversed. Prior to market liberalization the political community established a framework of incentives for corporate decision making. Today, fluctuations in market price establish the risks by which industry seeks political concession. This reversal has resulted in a complex of reflections and practices for representing values as well as the rise of new social orders seeking to provide what I call horizontal integration. These orders serve not only as political economic arrangements but also as style-setters for the production of shared meaning. Elsewhere, for example, I identify techniques that Cambridge Energy Research Associates adopts to redress the uncertainties of their clients: through scenario planning and executive roundtable meetings Cambridge Energy objectifies risks and operations of the industry in ways that tend to generate undisputed knowledge. They integrate technical prediction with fashionable modes of communication to create socially amenable and also to some extent ritualized occasions that underline the knowledge (predictions and solutions) that are being fashioned. In this paper, I highlight examples of media representation (brochures, advertisements) at Energy Consultant executive meetings where participants become witness to a detailed interplay of images about global energy development. I argue that these images establish a relation between Consultant Energy's intended audience, energy executives, and those defined as outside it, typically government and energy consumers. This relation serves as an techno-economic guide for executives in

navigating key shifts in the legitimacy of their elite rule. The work links the methodological insights developed by Collins and Evans (2002) for studying the upstream activities of a core-set of experts to the relationship between theory and realities, Callon (1998b, 2007) and MacKenzie (2006a, 2006b) have employed in the idea of performativity to identify the various styles of operating that accept abstractions as part of the forces that influence science or market evolution and indeed authorize some particular future that is desired. The proposed investigation aims to transfer from the study of economic and financial transactions in general to understanding the specific activities of consultant forecasters working within the energy industries.

125. Engaging Publics/Engaging Technoscience in the Asia-Pacific region I: Environmental Sustainability Transitions

9:00 to 10:30 am

5: 533

Summary This session is the first of three sessions the new Asia-Pacific STS Network is presenting at 4S as a panel. This one is on environmental sustainability transitions; the next two follow the same theme of engaging publics/engaging technoscience, but raise two other highly relevant STS topics in the Asia-Pacific: Indigenous knowledges and techno-life sciences respectively. Contemporary technosciences governance requires new practices, different institutional arrangements, new networks and forms of public participation about technoscientific innovation. This session will explore strategies for engaging publics in technosciences innovation and governance and the understandings that inform those strategies in the Asia-Pacific region (that is, countries of Australasia, East Asia, SE Asia and Oceania) with regard to environmental sustainability transitions. Papers provide critical analysis of engagement strategies across technical/non-technical boundaries and the way these boundaries are confounded and reworked in particular contexts. In that analysis, the papers reflect on the limitations of, or constraints to, inclusive particaptory approaches, reasons behind it, and on how public engagement in decision-making might be enhanced in/for the future. Central questions informing the session include: What are the particular challenges that we face in the Asia-Pacific region? What changing or new practices of technoscience governance are emerging and how effective might they be? What is the role of government and/or the role of civil society in technoscience governance? Do current developments suggest 'public talk' or a genuine move towards a paradigm shift in governance, and what are the implications of either? What trajectories of particaptory governance might contribute to better civic involvement in policy steering and result in better policy outcomes? Rationale Unique and complex technoscientific issues have created formidable social challenges for the future. For all their promise, technoscience innovations are immersed in controversy, public distrust, complexity, and scientific and social uncertainty, for example, GM crops, nanotechnology, hard water management approaches, wind energy, stem-cell research, neurosciences, cloning, tissue engineering, and so forth. The speed at which new developments demand attention is accelerating. These sessions address these important issues and social controversies for technoscientific governance which is an important area now being widely addressed by STS scholars, and aligns especially to the following key themes of the 4S conference: public engagement/social movement and science, technology, and public policy. Contribution to STS The three Asia-Pacific STS Network sessions contribute to a key STS issue: technosciences and their governance at a pivotal time when the ground rules that connect citizens to the state are up for revision and reformulation, and when experiments with technoscience/society dialogue are available for critical analysis. In addition, the session highlights the Asia-Pacific region as a new focus of inquiry that departs from the usual focus on the US and Europe. The Asia-Pacific is an emergent and important area in world politics, trade, and technoscience development and because of its diverse cultures (both non-indigenous and indigenous) and socio-political contexts offers a valuable 'point of difference' (or 'politics of differences') for discussion on and insights in a contested localising-globalising world where technosciences are convergent.

Participants:

Public Engagement in High-tech Development: A Critical Review on Technoscience Governance in Taiwan. *Wen-Ling Tu, Shih-Hsin University*

Asia is the most important and largest base for manufacturing high-tech electronics products. Since late 1990's, Taiwan has been known for its successful high-tech electronics development. However, the manufacturing of high-tech products has released hundreds of chemicals and generated thousands of tons of wastewater per day, of which the potential risks are still poorly understood by the public and even experts. Water contamination disputes in the early developed high-tech parks have raised great public concerns. As the government and business accelerate the pace of high-tech expansion and continue to build the new science-based industrial parks, local stakeholders and civic groups voice out their concerns in the environmental impact assessment (EIA) meetings of the proposed projects and demand a substantial, precautionary, and holistic review of environmental impacts caused by the high-tech development, and to ensure environmental sustainability. This paper takes the environmental disputes of the fourth stage development of the Central Taiwan Science Park (CTSP) as an example to discuss how the techno-bureaucrats conduct their risk communication, interpret scientific data, and defend the policy making in response to the challenges and inquiries from the local stakeholders and civic groups. The data collected for analysis is drawn from news clippings, EIA reports and meeting minutes, public statements issued by the public agencies and civic groups, in-depth interviews, as well as field notes from participatory observation of EIA meetings. By examining the statements and arguments presented by different stakeholders and public involvement within the environmental impact assessment (EIA) review process, the paper further explores patterns of risk communication by Taiwan EPA and analyzes the hidden agenda of technoscience governance in relation to Taiwan high-tech development. This paper argues that risk assessment and communication is not merely the scientific questions as the techno-bureaucrats claim. Such claims implied political exclusion and only resulted in public distrust and further conflicts. While addressing the challenges of citizen participation in environmental and scientific disputes, in conclusion, I discuss Taiwan's recent experiments on citizen deliberative meetings and their implications for enhancing science and technology communications, and environmental sustainability transitions.

Myth Management: Sustainability Technologies in New Zealand. *Bob Frame, Landcare Research NZ*; *Alison Collins, Landcare Research NZ*; *Shona Russell, Landcare Research NZ*; *Alison Greenaway, Landcare Research NZ*

Sustainability technologies must emerge to challenge dominant assumptions, beliefs and values (collectively termed myths) and open them up to scrutiny and reframing. New Zealand has deeply held myths of national identity built on notions of purity, vulnerability and ingenuity which have, often unconsciously, driven approaches to attaining economic and environmental prosperity. To move beyond this situation New Zealand needs to be a developer and early adopter of sustainability technologies. However there is a clear disconnect between policy intent and the magnitude of the changes required. We examine how new technologies are emerging to create new myths and enable shifts to greater sustainability. New Zealand has a highly interconnected research community which can provide a suitable test-bed for technological prototypes. Insights can be assessed relatively easily and their value considered for larger more complex jurisdictions. The paper examines a synthesis of three contemporary case studies of wicked problems in New Zealand relating to the techno-sciences of the natural environment: Water Allocation; Biosecurity and pest-control; and Hill country erosion In each there are dominant (Barthesian) myths that are privileged at the policy techno-science boundary which we explore using: Futures Studies (drawing on Slaughter's notion of Integral Futures) and Web 2.0 technologies with particular emphasis on social networking) to see how these could provide a means to challenge societal norms and through which new myths can be created. We explore the significant tensions between the research community and government, business and community relating to inherent contradictions and assumptions. Opportunities do arise for these to be raised and challenged but this is not easily taken up due to inherent conservatism. It is by

creating quasi-neutral opportunities for story-telling and interaction that the possibility for new myths can unfold.

Addressing Conflict, Legitimacy and Community Engagement around Wind Energy and Environmental Sustainability Transitions in Australia. *Richard Hindmarsh, Griffith University*

In late 2007, after signing the Kyoto Protocol, a new Australian federal government committed to significantly boosting Australia's energy consumption from renewable energy by 2020 in a transition to sustainable energy systems for a low carbon economy. With wind farms the most viable technology for the transition, little recognition, however, was paid to the intense social conflict surrounding wind farm development, which mirrors European developments. A key issue driving social conflict is lack of local inclusion in planning approval processes. The ongoing pressure of new social movements with landscape guardian groups in the vanguard, combined with climate change policy urgency, has resulted in policy responses, but in a context of technocratic decision-making, or the foreseeable future they signal a continuation of superficial community engagement in the pursuit of enhanced public acceptance for renewable energies. A key feature making these responses, for example, national guidelines for earlier developer engagement with affected communities (that, however, rely largely on a continuation of 'passive' engagement) is their reliance on economic and environment reasoning to guide their formation. That misses the other key rationale underpinning environmental sustainability transitions, which is the social. Indeed, early research shows that policy makers and wind energy interests lack a good understanding of the underpinning key social factors that drive social conflict. From analysis of the contesting wind farm coalition in Australia and of media representation, spoiled 'sense of place' (underpinned by place 'ownership and protective action') appears the main social explanatory factor for community contestation of wind farms, and informed by a range of issues, seems strongly interconnected to the need for redesigned inclusive decision-making approaches strongly informed by local embedment and understandings. In backgrounding the issues and early research findings, this presentation will outline the need to develop overarching systems institutional and practice redesign for policy and planning that reflects a strong participatory transition management approach, embedded in sustainability principles and practices. This new policy approach has much potential to improve wind farm policy and planning procedures in Australia to more meaningfully engage affected communities in the shift to ecologically sustainable energy generation systems.

Public Participation in Solid Waste Disposal: A Comparative Study of Two Case Studies in China. *Huiduan Ma, Northeastern University*; *Fan Chen, Northeastern University*

Along with the risk of using technology in modern industry, the sustainable development of environment and human society is threatened. The negative effects of industrial trash and solid waste disposal accompany the fast development of Chinese industries. More and more industrial trash is produced, which adversely affects the environment and the health of the Chinese people. Understandably, this causes opposition and conflict between citizens and government. According to the theory of social construction of technology (SCOT), the formation and use of technology is the outcome of public negotiation, with social structure, economic power and political factors shaping the developing process of technology. Such aspects of technology development are due to a number of technological and non-technological factors. Therefore, technology should be seen as a 'society-technology' system, where realizing the democratic control of technology from the perspective of public participation, and so to use technology reasonably and effectively, has significant meaning in the process of industrial modernization of China. This paper explores information communication between subject and object of technological use, to seek public participation approaches (especially for those impacted negatively by technological using) in decision making. To do so, it employs two case studies of solid waste disposal, which occurred separately in Pan Yu and Li Keng. The study compares their decision making process and executive processes, and their different lessons for 'success' and 'failure' in public participation. At the same time, it examines the mutual construction between national policy, government behaviour, and citizen attitudes, also the forming processes of 'win-win' and 'lose-lose' situations between public participation and government decision making. This is important in addressing the 'information gap' in the process of scientific and democratic decision making between government and people, and the necessity for the foundation of public opinion system according to the national policy of China of 'inquire strategy from people, inquire demand from people, inquire politics from people'. This will contribute to effective governance of environmental sustainability transitions.

Chairs:

Richard Hindmarsh, Griffith University
Wen-Ling Tu, Shih-Hsin University

126. Cross-Cultural Medicine and Medical Research

10:45 to 12:15 pm
12: 1212

Participants:

A Technological Quick Fix? Biomedical Assumptions and the Cultural Meanings of Circumcision in HIV Prevention. *Hector Carrillo, Northwestern University*; *Ana Amuchastegui, UAM Xochimilco - Maestria en Psicologia*; *Rodrigo Parrini, CENSIDA*

Over the past decade, global HIV prevention strategies have become increasingly medicalized. Proponents of the use of medical technologies, which most recently include adult male circumcision, generally have been critical of what they see as the limited effectiveness of behavioral and socially-oriented risk reduction programs. In the specific case of adult male circumcision, which some studies have found to reduce risk for HIV infection among previously uncircumcised men by as much as 60%, such proponents strongly advocate scaling up programs in regions where large numbers of men are uncircumcised and poor. As a one-time intervention, they argue, adult male circumcision is simpler than strategies that involve promoting sustained behavioral change or attending to larger cultural and structural issues. However, we argue that this biomedical discourse presupposes and maintains artificial distinctions between the medical and the behavioral, and between the technical and the social. In this talk, we examine the cultural meanings associated with adult male circumcision in a sample of 50 Mexican male migrants and female partners of migrants. These men and women participated in in-depth interviews in San Francisco, California or Michoacán, Mexico. Our findings demonstrate that the implementation of adult male circumcision programs in this migrant, and largely uncircumcised male population would likely confront considerable educational, behavioral, and sociocultural complications, not unlike the ones that behavioral or socially-oriented HIV prevention programs regularly encounter. More broadly, we analyze how medical technologies related to HIV prevention often come to be regarded as simple and devoid of the "messiness" of other forms of health promotion, in spite of their sometimes complex behavioral requirements and presuppositions.

Overseas doctors in Australian hospitals: negotiating degrees of difference. *Anna Harris, University of Melbourne*

As a discipline, medicine has expanded by moving its practitioners, with their skills and knowledge, from one part of the world to another. Amidst this expansion there has been considerable effort put into creating a sense of uniformity about biomedical practice, at both global and national levels. To help create this sense of universalism, the social labour involved in moving medical practices between contexts has tended to be suppressed, or hidden from view. In this paper I contribute towards the study of transformation in medical practice by drawing upon my ethnographic study of overseas trained doctors

working, or looking for work, in three hospitals in an outer-metropolitan Australian suburb. I argue that, for the overseas doctors, the social labour involved in moving between clinical contexts entailed a process of adjustment. This was their response to the 'familiar unknown'/'unfamiliar known' (Thrift 2004) arrangement of social relations in their new hospital environments. Whilst adjustments are everyday happenings in hospitals, I suggest that the overseas doctors had to put more work into theirs because of a history of practice developed in medical places 'elsewhere'. Their adjustments were more obvious than the locals, who wore their environments like a well-fitting white coat. The paper examines what I argue were five main characteristics of the overseas doctors' adjustments: first, there were modes of adjustment, encompassing both the variety of difference in the overseas doctors' practices and the multifarious aspects of the environment to which they adjusted; second, adjustment was required on an ongoing basis because the system was continually changing; third, adjustment happened as an embodied process; fourth, adjustment implied moving from the past to the unfolding present, from previous environmentally situated practices to new contexts, a constant threading back and forth; fifth, the mechanisms of adjustment meant that glimpses were attained of both of the overseas doctors' pasts and the system they were becoming part of. In the paper I explore these characteristics of adjustment through a small selection of ethnographic stories that involve participants' adjustments to paperwork, registration processes, hospital buildings, assessments, clinical procedures, staff and patients. Analysis of these ethnographic details contributes to conversations in STS regarding the creative tension between universal and local medical knowledges. Participants in the research were part of the increasing number of migrating health practitioners redefining and reshaping hospitals as 'local' institutions shaped solely by the society and culture in which they are embedded. In this paper I thus contribute to a dissolution of both the universal and the local in medicine, raising questions that concern medical practice in hospitals more broadly.

Returning the (Medical) Gaze: How Do Immigrants Embrace and De-Center Medicalization? *Ming-Cheng Miriam Lo, Sociology Department, University of California-Davis*

Much research has documented how racial minorities are marginalized, in multiple ways, in the U.S. healthcare system. Building on these rich studies, scholars have also studied providers' responses, developed practical guidelines for doctors and hospitals, and examined the sociological implications of these interactions. What is less well understood, however, are patients' own strategies and coping mechanisms for addressing their healthcare disadvantages. My study takes up one aspect of this important but under-studied question. I investigate how two immigrant patient groups, low-income Mexican and Vietnamese Americans with little or no English skills, deal with the issue of inadequate medical attention. My analysis of 60 in-depth patient interviews yields two patterns of coping mechanisms: "active engagement" and "medical pluralism." Drawing on theories of medicalization, I further explore the empowering/disempowering potential of these two coping mechanisms. I argue that immigrant patients are potentially empowered as they struggle to make use of medicine as a tool that brings a sense of control in their lives, but in the process they can become vulnerable to the ideological domination of biomedicine, which, in turn, is complicated by the tenuousness of their ties to institutional medicine. Mexican and Vietnamese patients are also found to attach different meanings to their experiences of medicalization, in part shaped by their different immigration experiences. This study is important as it describes and theorizes the expression of agency of marginalized patients, illustrating how, even in their structurally disadvantaged positions, they are not simply victims.

Staging clinical trials, performing science and gender: Microbicide research in Zambia and the UK. *Catherine Montgomery, Health Policy Unit, London School of Hygiene & Tropical Medicine*

Law has referred to socio-technical relations as an 'intricate dance', reminding us that neither society nor technology is static or given, but both are in a constant interactional process of becoming. In this paper I explore the performance of gender and science across the global sites of technoscientific development in the field of HIV prevention. Vaginal microbicides are pharmaceutical products in development, designed to reduce the sexual transmission of HIV in women. They are commonly known as a 'woman-controlled technology' and tool for women's empowerment, and form part of a burgeoning field of clinical research into new biotechnologies for HIV prevention. Foundational to the pharmaceutical development of microbicides is the medicalisation of women's powerlessness, specifically that of women in sub-Saharan Africa. However, the commodification of women's empowerment through microbicides advocacy in the activist, academic and political arenas constructs a new ideal of the autonomous woman, agential in her own sexual and reproductive conjunctures. To what extent do women participating in trials of this new drug in the global South validate or subvert such expectations in their use of the technology? The answer to this question is intertwined with the dynamics of other performances simultaneously being enacted in the scientific and political arenas, both in 'the North' and in 'the South'; as much as the microbicide movement configures the end user of the technology, it also sets the stage for the performance of particular scientific identities amongst scientific researchers across cultural and professional networks. In the past decade, STS has begun to focus on the fluidity of technological objects and the spatiality of technoscience across geographical and cultural locations. There is therefore a need - both theoretically and practically - to follow science across its sites of practice. Multi-sited clinical trials are confined neither within geographic nor within disciplinary boundaries, traversing countries, institutions, and ('lay' and 'professional') communities. In this paper, I trace the performances of scientists and trial participants around a new drug for HIV prevention as it moves between the spaces of political agendas, scientific protocols, and everyday use in sexual relationships. Data for the analysis is based on interviews with senior scientists in the UK and US responsible for developing and testing an experimental microbicide, and interviews with Zambian scientists and trial participants, responsible for implementing and participating in a trial of the product. This research provides a detailed analysis of the interaction between gender performativity and science in action, challenging the sense of 'gendered' technologies for a 'feminized' epidemic. It addresses the neglect of the global South in STS, demonstrating that the traffic in, and fluidity of, health technologies between 'North' and 'South' provides an analytical domain that is both intellectually rewarding and pragmatically relevant. As such, it also contributes to the debate about reconstructivist STS; by adopting STS sensibilities to address public health in developing countries, it pushes both fields to consider their normative and theoretical imperatives.

127. Climate Change

10:45 to 12:15 pm

12: 1213

Participants:

Hide the decline or hide the process? Climategate and the construction of scientific facts. *Marianne Ryghaug, Norwegian University of Science and Technology*; *Tomas Moe Skjølsvold, Norwegian University of Science and Technology*

In November 2009 a controversy was triggered by the fact that thousands of e-mails being leaked from the Climate Research Unit at the University of East Anglia. The Times reported: "E-mails allegedly written by some of the world's leading climate scientists have been stolen by hackers and published on websites run by climate change sceptics. The sceptics claim that the e-mails are evidence that scientists manipulated data in order to strengthen their argument that human activities were causing global warming." Similar reports were given in many newspapers,

together with scattered quotes from the emails. The Telegraph reported: "One email seized upon by sceptics as supposed evidence of this, refers to a "trick" being employed to massage temperature statistics to 'hide the decline'". The financial times similarly reported early on that "One e-mail from Professor Phil Jones at UEA to several climate scientists spoke of using a 'trick' to hide 'the decline' of temperatures." The content of the e-mails and the reaction to them both from climate change sceptics and in the mainstream press may reveal important insights into the dynamics of science and the interrelation of scientific expertise, science communication, and social movements both with regard to climate change research and more widely. The leaked emails are interesting; not only because of the glance they provide behind the scene of science in the making, but also because of the media coverage they generated, and the ways they have been framed in the media. From an STS perspective this also provides an interesting gateway to study how the "public" perceives science. In this paper we look at both the content and rhetoric of the e-mails themselves for evidence of how the climate change community functions, and the wider repercussions of the leak. The leaked material from the Climatic Research Unit (CRU) at East Anglia University consists of 1073 text files containing e-mails, and nearly 3500 other files and documents. This analysis has taken into account all of the 1073 emails, but have not dealt with the remaining material. The analysis particularly focuses on two of the most discussed episodes in the e-mails: the discussions surrounding the famous quote to "hide the decline" and the discussions on the use of climate models and scenarios in the upcmming IPCC report. We also analyse how the media framed the controversy following the leaked emails— what made the controversy into a scandal of such importance that it was named 'climate gate'?

Making the invisible visible: Metrics as the main opportunity in the use of ICT for climate change mitigation. *Jorge Luis Zapico, The Royal Institute of Technology*; *Marko Turpeinen, The Royal Institute of Technology*; *Nils Brandt, The Royal Institute of Technology*

Climate change has become one of the most important challenges of our time. Institutions and individuals are working towards reducing their emissions. However the qualitative information needed as carbon dioxide emissions and energy use, are usually invisible in the moment of decision and only available through future analysis. There is a gap in the feedback. Without measurement there is no way of knowing how well expectations and intentions have been met; a gulf of evaluation. Making visible the invisible variables as carbon dioxide and energy is a needed first step to solve the problems, and ICT is a key for that. As computers are becoming more pervasive, metrics are getting more accurate, more extensive, and more important in the way the world is viewed and decisions are made. Environmental data as carbon dioxide emission should not be an exception. This paper uses as a starting point the emerging research area focus in the potential positive effects of ICT for reducing carbon emissions. From existing examples and literature studies three points are used to summarize the main opportunities: Optimization, dematerialization and behavioral change. These are areas where extensive work is ongoing, including projects in smart grids, telecommuting or smart meters. This article argues that metrics, the measuring and accounting of data, can be seen as the underlying concept common throughout all opportunities. Optimization is clearly data-centric, measuring and data analysis is central in the decision making and evaluation of efficiency applications. But there is also a need of qualitative and quantitative environmental data for helping towards changing behaviors, and a need for measuring effects for an effective dematerialization. The use of modern information technologies can provide two key characteristics to the metrics: real-time access and bottom up gathering. With sensor technologies it is possible to have accurate "metabolism" accounting in real time. Instead of the traditional analysis performed by life cycle assessments and such studies, the use of sensors and information technologies allows a real time control of bottom up data. This allows for more accurate information and faster possibilities for response measures. Combining the sensors with electronic control devices allows for real time optimization. ICT also enables the possibility for bottom up measurements, moving away from statistical data. This is possible not only for industrial and mechanical processes but also for personal, household, or even city "metabolisms". With advanced techniques it is possible to measure an individual carbon dioxide metabolism in an accurate way and then provide instant feedback of the impact and how to reduce it. This article proposes that extended research on metrics for climate change related information can foster the existing possibilities of using ICT for reducing carbon dioxide emissions and it could improve the quality of decision making both at personal and institutional level.

Probabilistic Projections and the Uses of Scientific Uncertainty in Population-Climate Advocacy. *Jade Sasser, UC Berkeley*

What role does scientific uncertainty play in mobilizing arguments for social and political advocacy? How can the very nature of uncertainty itself serve as a foundation for claims justifying the urgency and immediacy of global action? This paper explores the ways probabilistic projection models used to forecast demographic and climate trends are used to mobilize a growing base of advocates around the population-climate nexus. Specifically, the paper argues that the uncertainty inherent in probabilistic projections gives rise to crisis discourses which providing a platform for contemporary arguments advocating global population stabilization in order to mitigate future climate change. Drawing on future population growth models produced by the United Nations, juxtaposed with probabilistic projections of past and potential future climate trends produced by a variety of climate scientists, I argue that the lack of scientific certainty reflected in these models serves as an efficient means of constructing political advocacy campaigns targeting campus youth activists, by building on discourses of fear and notions of globalized moral responsibility. The paper tracks a growing movement, based on U.S. college campuses, to train youth as advocates for increased international family planning budgets, with the goal of helping nations of the global South mitigate future climate change through future reductions in population size. Through this movement, I trace the historical use of discourses of risk, uncertainty and impending crisis as a motivation for social, political, and health actions, investigating the varying ways in which scientific knowledge is alternately used to produce uncertainty, and to alleviate it. The paper contributes to the STS literature by building on theoretical contributions elucidating the role of scientific evidence in creating social movements, as well as the role of uncertainty in scientific knowledge production.

Social representations of climate change among Swedish lay people. *Victoria Wibeck, Linköping University*

The aim of this paper is to analyse how lay people in Sweden form and maintain social representations of climate change. The paper will discuss how focus group participants use different communicative strategies to make sense of conflicting messages about causes, effects and responses to climate change. Climate change is a topic which has been subject of scientific and political controversies and widely debated in the media during the last few years. Many actors claim that climate change is one of the most fateful questions of our time, largely affecting the general public. To meet the challenges of climate change, the public is expected by politicians to take responsibility for actions towards the reduction of climate impact. Hence, strategies for supporting climate-friendly lifestyles and consumption patterns among the public are being discussed across political as well as scientific communities. Yet, climate change provokes controversies, in the scientific as well as the political arena. Even though the latest report from the Intergovernmental Panel on Climate Change (IPCC) stated that global climate change has anthropogenic causes, scientific uncertainty remains e.g. as to what degree of temperature increase is most likely. The 2009 UN

Conference of the Parties in Copenhagen demonstrated that the political controversies on appropriate strategies for mitigation and adaptation to climate change are far from settled. In addition, the recent media attention to the so called 'climategate' and 'glaciergate' stories have brought about a debate in the media about the legitimacy of the IPCC process and given room for opposing standpoints on climate-related matters. The lay person thus finds herself surrounded by contradictory messages in a way that is typical of controversies having their roots in multi-faceted societal and scientific problems involving a multitude of stake-holders. Many voices are blended in the discourse on climate change, representing different positions and standpoints towards how lay people could best contribute to the mitigation of and adaptation to climate change effects. This paper will be based on preliminary results from an ongoing research project studying how lay people form and maintain social representations about a controversial and complex issue such as climate change. The project employs focus groups as a method for studying sense-making in action, and the paper will draw on examples from focus group discussions with Swedish lay people. In the analysis, special emphasis is put on sense-making practices in relation to the concepts of trust and agency. There is limited knowledge about how scientific and political controversy affects the formation of lay representations of an issue of great societal relevance, such as climate change. This paper will link the field of controversy studies with the theories of dialogism and social representations by focusing on how different types of arguments and communicative strategies interact in lay peoples' construction of meaning of climate change.

The Science Politics of Arctic Climate Modelling: How Trust in People Is Building Trust in Numbers. *Nina Wormbs, Royal Institute of Technology*; *Sverker Sörlin, Professor of Environmental History*

This paper traces the different steps taken towards modelling the Arctic climate, beginning with the Atmospheric General Circulation Models in the late 1960s, which had an Arctic representation, and ending with the now emerging coupled, dynamic regional models for the Arctic. The importance of the Arctic climate to the global climate has been acknowledged, and debated, for at least a century. Arctic climate modelling in any comprehensive and coupled way, however, is a fairly recent activity. A central question for this paper is how and when the Arctic became important for climate modelling. Vice versa the question of how climate modelling became part of Arctic research is of great interest as an illustration of the interplay between regionally focused polar research and global climate change research. Closely connected to this are issues concerning the science-policy processes in the Arctic regional cooperation and the growing public attention to Arctic climate change. For example, the Arctic Climate Impact Assessment (published in 2005), a project under the auspices of the Arctic Council and the International Arctic Science Committee, set up to evaluate among other things Arctic climate change, stated that regional modelling was underdeveloped, yet did not immediately result in a push to improve regional models. The paper discusses the interaction between what might be called an intra scientific drive to develop regional models and an extra scientific demand to refine model predictions in the Arctic for policy reasons. At the same time the paper analyses how these borders are re-negotiated, in part by scientists bypassing media and working directly with politicians and policy makers. The need to create trust in models, both for policy and science, is in this way complemented with the process of creating trust in people who take on roles as brokers, arbiters, or even as de facto policy-makers, often using large international science programs and international organizations, or creating new ones like the IPCC. Within the STS-field the creation of trust in processes like these have gained greater attention in recent years. This paper aims to contribute to that discussion. The paper builds on interviews made with modellers and meteorologists and analysis of projects and papers identified as building blocks in emerging Arctic climate modelling.

128. Science, Technology and the Governance of Public Health Challenges (1)

10:45 to 12:15 pm
12: 1214

Participants:

An actor network theory analysis of the evolving relationship between influenza and the State. *Gearoid M Cuinn, University of Nottingham, UK*

Only a handful of governments took precautionary measures to mitigate the impact of the Spanish flu pandemic of 1918-19. Britain, a pioneer in public health, was no exception as the central authorities failed to take preventative action and tackle the disease. Most scholars blame World War I as necessitating a detached 'carry on' attitude in public health policy. Using discourse analysis of primary archival, medical, legal and media sources this paper follows the particular actors, including public health laws and the influenza microbe, to reveal how relevant networks coalesced, strengthen or failed during the Spanish flu pandemic. Owing to prior experience of many of the actors involved with tackling the Spanish flu it was the Russian flu pandemic (1889-92), as it is known in the West, which pre-determined how influenza was to be dealt with. In 1889 the medical profession, eager to maintain professional autonomy, were reluctant to take on public health legal obligations to tackle the disease. Their successful resistance of these measures shaped a reactive rather than proactive policy towards influenza which persisted until the arrival of Spanish flu. This paper also suggests that it was a constitutional crisis that promoted the predominance of legality and formal accountability within the civil service. This burdened the public health service and reduced its capacity to anticipate and prepared for emergencies. Furthermore the shift in understanding of the influenza microbe from being a bacteria to a virus resulted in the production of new legal actors to accommodate these changes. These laws became associated to the microbe forming a hybrid actor that influenced public health actors, bacteriologists and the medical profession. This sheds new light on the failure of public health authorities to assume leadership during the both pandemics. With regards to socio-legal research, ANT provides a way to study law in its various forms, through the networks they are expected to influence while revealing unforeseen consequences. This study contributes to the development of studying socio-legal actors and highlights the strengths and shortcomings of the ANT approach, not only with regards to its theoretical underpinnings, but in tracing the relationships of non-human actors with a changeable or non-existent material form (e.g. laws).

Experts' conflicts concerning national and local link of a French Health Public Program against obesity : A controversy among ontological visions of action. *Philippe TERRAL, SOI - Université de Toulouse*; *Fabien MERLAUD, SOI - Université de Toulouse*

Our research try to understand how is managed a French Nutrition Health Program called "Programme National Nutrition Santé" (PNNS). The first purpose of this program is to reduce obesity with some advices concerning nutrition and physical activity. More recently, the program considers others pathologies as diabetes or cancers for example. The project finally becomes a general health public program considering health prevention more than diseases' treatment. Our objective is to understand specifically how is conceived the question of health prevention. We focused the analysis on experts' positions also considering their relations with civic and socials groups as food or pharmaceutical industries and public policies actors for example. Major parts are scientists from different fields: physicians (nutritionists, endocrinologists) but also psychologists and even researchers in communication sciences. Our work identifies the reasons of the divergences among them. The research is based on a large analysis and numerous empirical investigations : questionnaires, interviews, collection of different kind of texts where the experts argue their point of view (scientific papers,

press, political reports,). These data were analyzed with Prospero software. Prospero (Chateauraynaud, 2003) was conceived as a program for the analysis of corpora of texts characterized by a certain variability (particularly in their use of argumentation and time). We consider all the experts discourses as a "dossier"; that is as a collection of texts characterized by opinions concerning health prevention. Our results show that discourses express epistemic or moral questions but also power processes in different political spaces. We precisely try to show that arguments deployed mix different purposes: organisational (importance of national level of the program or local level which includes more civic groups), axiological (educate everybody as a global person - that is to say physically and psychologically - versus transform the way of nutrition of "risk groups"), epistemic (two theories of links among ideas or theories and action: rationalist option versus a more "emergent" and "situated" vision of action). We finally argue that controversies among scientists concerning this health public program reveal that the tension between national and local level of the program depend on the kind of knowledge (medicine, psychology, communication) which support expertises and also, depend on the different experts 'ontological visions of action. On the basis of this research, our paper would also discuss the question of the link between science and society and that some researchers (Nowotny, Scott, Gibbons (2001) for example) evoke as a new regime for production of knowledge where preoccupations of utility are central. We especially want to show the major role of communication sciences in this process. Indeed, in this health public program and the national institutions associated, the experts of communication become little by little more important and participate to blur the frontier between scientific knowledge and information.

Towards Patient 2.0: Empowerment and self-management Technologies. *Finn Olesen, Aarhus University*

In recent years there has been a shift in public health recommendations regarding the responsibilities of the state to support patients with cronic health conditions like diabetes, or cronic obstructive lung disease. They are often able to live in their own home and surroundings with help from family and health professionals. Following this shift, discourses of 'patient-centered' health care practices, and 'patient schools' have intensified, expressing health politicians wish for more patient autonomy and liberations from physician-dominated hospital regimes. This liberation is often labeled 'empowerment' (as opposed to 'compliance'). One ambition of such empowerment is that individual patients will be able to handle their disease in accordance with own values and desires. New personalized healthcare technologies are being researched and developed to help empower these patients, not least under headings such as 'patient 2.0', 'telemedicine', and 'pervasive computing'. In the presentation, I will discuss from a sociotechnical, posthuman stance, how to interpret the shifting roles and agencies of patients with cronic diseases under the conditions described above. New sociotechnical orders also bring new disorders, and we need terms to verbalize them. Based on case studies and literature reviews, I will argue that health care policies to empower sufferes through sociotechnical strategies may not just transform, but also diminish intended agencies and powers of the individual patient. Well-intended contexts of personalized health technologis may thus dilute meaningfull conceptual boundaries between patient, user, client and citizen, and decrease state responsibilies in the process.

129. Building theorised research designs: Biographies of artifacts and practices approach

10:45 to 12:15 pm

12: 1222

Whilst scholarship addressing the social and cultural issues surrounding new technology is blossoming, many of the studies, framed within well established modes of research, are producing unhelpfully simplified readings of the characteristics of technologies (particularly more complex ones) and their implications for organizations. In particular research on particular socially and temporally bounded locales - for example the typical implementation case study - has become the norm and given undue emphasis within, for instance, Business and Orgaisation Studies or Information Systems scholarship. Often influenced by constructivist frameworks and qualitative methodologies - including Actor Network Theory (ANT) and ethnography - scholars have developed actor centered analyses and rich local pictures of the immediate response by organizations and users to these systems. However we are skeptical that the most useful way to study new technology is solely at the place where the user encounters it, or where a designer envisions it. One implication of focusing only on certain locales or moments (like implementation or particular design episode) is that important influences from other levels and timeframes are missed from analysis. Lest we forget, most technologies come in the form of more or less packaged products that are relatively generic and designed at some remove from the place and time where they are used. They are often instantiated at multiple sites and across distributed contexts. To go beyond the limitations of currently favoured research designs we propose an alternative research approach - the emerging 'Biography of Artefacts and Practices' (BoAP) framework - that attempts to take seriously the multiple locations and different timeframes in which new technologies operate and evolve. We argue that if technology studies researchers are to fully understand the mutual shaping of technology and society they need more adequate spatial metaphors to understand the influence of technology supply, usages and intermediaries involved as well as the broader historical setting - we are thus in need of an approach able to track the trajectory of technological artefacts and the range of related social practices and institutions over time. The framework developed is based on a review of relevant scholarship from Science & Technology Studies, Business/Organization Studies, Cultural Psychology and IS research combined with observations from a growing set of multi-local, multi-temporal empirical explorations encompassing technology inception, development and use.

Participants:

The surprising orderly world of Multicommunity Artefacts. *Christian Koch, Institute for Business and Technology, University of Aarhus*; *Chris Harty, University of Reading*

Some artefacts are developed as and from, their role as mediating devices between more communities. Often understood and conceptualised as boundary objects, this paper will revisit Star & Griesemers original rich concept and develop it further. Most studies using boundary objects to understand artefacts as mediators tend to collapse the term into relative simple "twoway" mediating, whereas here the full complexity of multicommunity boundary objects is unduly disregarded. However here we see to revitalize it appreciating the complexity of certain IT-artifacts. Using two cases from the IT area, the paper will moreover compare the historical development of Enterprise Resource Planning Systems and Building Information Models. The paper aims at analysing how multicommunity software artifact exhibits a surprising flexibility in its ordered - nonordered balancing between communities.

Beyond the Implementation Study: Studying the Biography of Packaged Software Artifacts. *Robin Williams, University of Edinburgh*

The concept of Biography of Artefacts emerges from reflections upon a long-term programme of research into the development and evolution of complex company-wide information systems known today as Enterprise Resource Planning (ERP) systems with roots that can be traced directly back to 1960s computerised stock control systems and Material Requirements Planning systems developed in the 1970s. A series of studies conducted over two decade provides an occasion to reflect upon the multiplicity of moments (e.g. of design, implementation, use) in which a technology is created and evolves as well as the kinds of analytical template and research design needed to provide an adequate account of these developments. Particular kinds of research design are, perhaps unconsciously, geared towards certain kinds of finding. The current fashionable but simplistic research designs (e.g. single site ethnographies or exhortations to follow the actor) are poorly equipped to tackle such complex technological developments and may produce inadequate and

misleading accounts. The Biography of Artefacts framework provides cues for a multi-temporal and multi-local analysis.

Applying the Biography of Software Methodology to the Making of a Software Market: The Case of Contract Management Software. *Carolyn Paris, London School of Economics and Political Science*

Information systems development in the organizational setting today more typically involves the procurement and integration of commercially available software, rather than traditional requirements and software engineering. Understanding the origins, design, affordances, reach, and trajectory of commercial-off-the-shelf (COTS) software has thus become crucially important for information systems designers (including chief information officers and chief technology officers). It also presents an interesting and significant problem for information systems and social studies of science researchers, as COTS vendor offerings come to define principal features of the information habitat, as well as organizational self-awareness. The biography of software methodology offers a potentially valuable methodological approach to this important problem. This paper discusses the application of the biography of software (a biography of artifacts and practices) approach to the making of a particular software market, contract management software (CMS). Contract management software is a relatively small software market, about ten years old. Despite early predictions of Gartner, an important market analyst and gatekeeper, CMS has failed thus far to achieve significant growth, while at the same time attracting competition from multiple directions. This paper argues that the biography software of approach is an appropriate methodology for investigation of this software market, involving an identifiable product offered by multiple vendors. The paper further argues that the approach may be usefully oriented around the question of locating accountabilities for design, with practical implications for potential customers but also more generally revealing the nature of COTS design and suggesting potential consequences or outcomes. Lastly, the paper identifies methodological challenges encountered in investigating business COTS, taking CMS as an example, and notes implications for the biography of software approach.

From practice-bound imagination to evolving impacts: implications of biographies of artifacts and practices approach. *Sampsa Hyysalo, University of Helsinki*

How development and use of new technology relate? How can users contribute to innovation? In this paper we condense findings from a recently completed set of studies on Health technology innovation. Reported more fully in Hyysalo, Sampsa 2010 "Heath Technology Development and Use: From practice bound-imaginations to evolving impacts (New York:Routledge)" These studies followed in-detail particular technologies over several product launches, and examine the emergence of inventive ideas about future technology and uses, how these are developed into products and embedded in health care practices, and how the form and impact of these technologies then evolves through several rounds of design and deployment across different types of organisations. The projects and practices studied ranged from an attempt at breakthrough innovation in clinical testing equipment, to user-led innovation in database programs for diabetes care to developer driven project for new monitoring and alarm system for the elderly. The studies reveal a blind spot in extant research on development-use relations. The majority of studies have examined shorter 'episodes': moments within particular design projects, implementation processes, usability evaluations and human-machine interactions. Studies with longer time-frame have resorted to a relatively coarse 'grain-size' of analysis and hence lost sight of how the interchange is actually done. As a result there appears to be (a rather surprising lacunae of) social science, information systems or management texts which comprehensively or adequately address: *how different moments, sites and modes of shaping new technology shape the evolution of new technology; *the detailed mechanisms of learning, interaction and domination between different actors and technology during these drawn out processes; and *the relationship of technology projects and the professional practices and social imaginations that are associated in technology development, evaluation and usage. *the often significant changes in what "agency" and "impact" technologies, developers and various users have in different times and locations in the biographies of technology and related practices. The "biographies of technologies and practices" approach to new technology advanced further in this presentation offers us urgent new insight to core empirical and theoretical questions about how where development projects gain their representations of future use and users, how usage is actually designed, how users' requests and modifications affect designs and what kind of learning takes place between developers and users in different phases of innovation. Most importantly, however, it we focus the research set-ups and requirements for methodology for combining historical and ethnographic analysis at multiple scales of inquiry.

"Following actors' viewpoints" - A relational approach to the study of the Agora of Techno-Organisational Change. *Antonios Kaniadakisis, London School of Economics and Political Science*

Tensions between generification strategies in technology supply on the one hand and diverse user requirements in different locales on the other, have resulted to the emergence of a global supply-use chain, a cycle of development, distribution, implementation and use of packaged information technology (IT) solutions. This complex and loosely bounded socio-economic space, ranging from particular local instances of implementation to abstract technological visions and trends circulated on a global scale, has been captured by the notion of "Agora of Techno-Organisational Change" (Kaniadakis, 2007). The Agora is a 'practice space' for the development, distribution, implementation and use of packaged IT solutions. Within this space diverse heterogeneous actors (suppliers, users, intermediaries, consultants) are pursuing their interests and through choices and negotiations they contribute to the shaping of complex artefacts, like packaged ERP systems, over periods of time. In doing so, actors construct bounded perspectives of the Agora space based on their geographical position, their role within the Agora, their strategic visions and interests and their capabilities to access material resources and expert knowledge. Different actors (and different types of actors) develop different such understandings of the Agora, which we call 'viewpoints'. For example, an IT supplier has a different viewpoint on the Agora environment than an adopting organisation. In essence, viewpoints are actors' rationalities that serve as a mechanism to guide and legitimise choice (i.e. IT procurement choices). It is argued in this presentation that instead of embarking on the impossible endeavour to understand and theorise the Agora of Techno-Organisational Change in a unique and universal way, one should rather focus their attempts on embracing diverse understandings of it and in consequence diverse arrangements of context, space and levels of analysis and practice. The notion of viewpoint, apart from an active construct that actors develop and employ in their practices within the Agora, may also be used as an analytical device to understand this complex environment. To put it in Actor-Network Theory terminology, instead of 'following the actor' one should 'follow different actors' viewpoints' as they evolve over time and give us diverse alternative configurations of the Agora space. A viewpoint approach to understand the development, distribution, implementation and use of packaged IT over periods of time and within a broader socio-economic space will contribute to the advancement of the Biography of Artefacts and Practices approach, given the considerations raised by recent work in this area and the shortcomings of narrowly situated analyses of technology and organisation. Keywords: Agora of techno-organisational change, actors' viewpoints, supply-use chain, packaged IT solutions

Discussant:

Neil Pollock, University of Edinburgh

130. Experts and Expertise

10:45 to 12:15 pm

12: 1232

Participants:

Dieticians' Understanding of Coeliac Disease: An Empirical Investigation of Interactional Expertise. *Robert Evans, Cardiff University*

In much of the STS literature, a sharp distinction is drawn between what clinically trained medical experts know about a disease and what those who must live with the condition know. In some cases it appears that the latter can understand the former - that is patients can understand the science - but how well the clinical perspective incorporates the life-world experience is less clear. In this paper we present the results of an empirical investigation of dieticians understanding of coeliac disease using the Imitation Game method. The hypothesis being tested is that, as a result of their interactions with coeliac patients, dieticians will have developed the interactional expertise needed to understand the day-to-day concerns of living with an illness that they, themselves, do not have. The project is based around the Imitation Game method pioneered by Collins and Evans. The research involves a person with coeliac disease putting questions to two people: on is another person with the same condition, the other is a practicing dietician who does not have the disease but is instructed to answer as if he or she does. By comparing the answers, the questioner must decide which set comes from the person with the disease and which from the dietician. In each case, no participant knew the identity of the other two people and judgements were based purely on the form and content of the answers. Overall, 12 Phase 1 and 107 Phase 2 Imitation Games were carried out. As the hypothesis was that dieticians have interactional expertise, the predicted outcome was that the set of Imitation Games as a whole would correspond to a chance condition - that is to say, that the judge would only be able to correctly identify the dietician in half the cases. A systematic failure of the dieticians, on the other hand, would be revealed as an 'excess' of correct identifications. In fact, the outcome was and Identification Ratio of 0.11 (i.e. an excess of just 13 correct identifications from a sample size of 119), which is consistent with other chance conditions in other research. More detailed examination of the individual Imitation Games provides some insights into the expertise of dieticians and the sorts of experiences that they were most able to describe accurately. For example, dieticians tended to provide plausible answers to questions about behaviour when eating out, but were less convincing on the emotional consequences of the illness, when it should be disclosed to potential partners and so on. In summary, the paper contributes to the existing STS literature in two ways. First, it shows how the Imitation Game method can be used to investigate a topic of broad interest to the STS community. Secondly, it offers some specific insights into the nature of doctor-patient interaction and suggests that, in general, dieticians do possess the interactional expertise needed to understand the life-world concerns of the patients they advise.

Are we all experts? - On de-faming and re-framing expertise and its use in society. *Ulrik Jørgensen, DTU Management*

By declaring the need for a third wave in science and technology studies Harry Collins has fuelled a new controversy. While the argument for (re-)gaining a productive role for STS in societal controversies over development and change is well taken, the new approach to expertise does not bring us much further. The 'periodical table of expertise' returns to knowledge practices as something that resembles widely distributed skills, though with differences in depths. The concept of expertise is hereby 'naturalised' and looses some of its critical role in societal discourse. By stating that we are all experts, but in different fields of practice, some in handling language, others in plumbing, playing musical instruments, or in practicing a scientific discipline, the notion looses its specific meaning. All just to get to the final conclusion: some of us are half-learned just having rhetoric knowledge of the real thing - practicing science. In the paper expertise is analysed in relation to how expert are constituted through the need for specific types of advice within politics and management. Being an expert may in some few cases be a self-declared role, but experts and expertise cannot be understood in a general and non-contextualised setting. The paper draws on examples of the role of expertise in some scientific controversies ranging from hygiene strategies to climate change as well as in management and economic policy. It contrasts the use of expertise in relation to professional advice for government, in public debates and in news media, where expert are often used as an objectifying third party to settle certain questions and displace them from political controversy. This empirical approach raises questions to the consequences of 'naturalising' expertise. My point is more than a relativist argument, but is an attempt to situate expertise as framed knowledge that is already part of an instrumental approach to understanding and solving problems. In most professions expertise is related to specific problem settings. Experts find themselves in conflicts more based on differences in the ways problems are stated than in relation to the practices and knowledge related to their expertise. Harry Collins distinction between the different levels of expertise is challenging as its opens for tests and experiments, but at the same times removed the focus from the context of knowledge and removes the ability of identifying the framing conditions and differences in problem settings as a different kind of meta-expertise. The critical stand on expert knowledge and scientific discipline as specific forms of framing is not just a question of having rhetorical skills in handling the lingua of a field of practice. It has the potential of establishing a critical understanding of disciplinary work and practiced expertise within a scientific domain. Hereby science and technology studies does offer more than some rhetoric and managerial meta-expertise, but offers a critical and comparative perspective and societal useful knowledge on how problems and knowledge based solutions are constituted and sometimes co-constructed within specific visions for social change and control.

Screenwork as the social organization of expertise. *Phaedra Daipha, Rutgers University*

Despite the great variety of visual representations flooding the places of expert activity, there is no question that, today, they mostly reach their destination through computer screens. In effect, it is computer screens that have come to colonize the spaces of knowledge production and it is screenwork that now forms the backbone of expertise. This paper attempts to explore the implications of the notion that current forms of expertise are acquired, produced, performed, and consumed on the basis of ICTs in general, and visualization technologies in particular. I draw from twenty-two months of fieldwork at a weather forecasting office to outline a framework for studying expertise as screenwork, paying special attention to how screenwork practices (re)structure the negotiation of skills and professional authority, the coordination of information and resources, and the emergence and institutionalization of novel organizational fields in the so-called knowledge economy. By reformulating expertise as screenwork, this paper aims to systematize and expand ongoing debates in STS as well as the sociology of work and occupations around the technological transformation of the workplace.

Collaboration in the design process: Materiality matters. *Laura Noren, New York University*

Product designers face the problem of establishing boundaries where there are none. They begin with a collection of imagined users and uses and end up with a physical product. This project examines how the increasing reliance on digital design tools - from software to CAD/CAM hardware - impacts the experience of collaboration among designers through the creation of boundaries. Building on literature that examines the way digitizing design has changed the products, this project asks how designing in digital space changes the way designers collaborate with one another (Kolarevic, 2003; Henderson, 1999; Mitchell, 1999; Mitchell, 2001; Franken, 2003). Theeoretically, the work

is situated between organizational studies and social studies of technology. It draws on concepts from Latour's actor-network theory, Suchman's sociotechical systems, and calls to bring together studies of social practices, technology, and materiality (Pels, Hetherington, Bandenberghe; 2002; Latour, 2005; Orlikowski, 2007; Suchman, 2007). It is also informed by Richard Sennett's work on the importance of craft in the work place (Sennett, 2008). The comparative research was conducted using ethnographic and interview data from two field sites: a design degree program for graduate students with a focus on automotive design and a professional worksite for product and automotive designers. Observations were made during daily activities and included routinized captures of on-screen activities as designers worked in CAD software and online. Findings indicate that collaborations, especially among the students who were required to produce sole-authored theses and dissertations, moved towards a network of experts with a diminishing overlap in day-to-day design and engineering problem-solving and development. The quality of interpersonal relations was maintained during the construction and later experimentation with physical prototypes and periods of play in the lab, though these physical prototypes occasionally made clear schisms in the group that were less apparent during periods of on-screen development. Periods of on-screen design and engineering were characterized by low degrees of conflict and low degrees of cooperation. Among professional designers, collaboration was structurally encouraged through group evaluations and the relatively longer co-tenure of employees (as compared to students whose tenure is known to be limited). Periods of both conflict and cooperation were higher during periods of on-screen design and engineering among the professionals than they had been among students. While co-operation and conflict among the students was most likely during periods of constructive play with material objects and physical prototyping, the professional designers and engineers had somewhat more even levels of co-operation and conflict throughout the design process lifestyle though they had similar spikes of conflict and co-operation around materials testing and prototyping phases. This research raises questions about the importance of materiality for collaboration in the design process.

Connecting psychology of science to Studies of Expertise and Experience: Results from a Workshop. *Mike Gorman, University of Virginia*

In August of 2010 a workshop will be held after the International Society of Psychology of Science and Technology (ISPST) meeting to which members of the Study of Expertise and Experience (SEE) group were invited. The goal is to combine insights about expertise from both communities, creating a kind of trading zone out of which, it is hoped, new research collaborations will emerge. The ISPST includes scholars from multiple disciplines who have studied of the acquisition of scientific expertise, comparison between experts and novices and studies of reasoning strategy. SEE has introduced a new taxonomy of expertise, including interactional expertise, or the ability to interact fluently with an expertise community without being able to do the experiments or build the instruments or develop the quantitative models. SEE has also introduced a new method, the imitation game, for assessing who has interactional expertise and at what level. One hoped-for workshop result will be new research ideas and additional methods. The workshop organizers are Greg Feist, San Jose State, Evan Selinger, Rochester Institute of Technology, and David Stone, Northern Illinois University; Gorman will attend and present his view of what the workshop accomplished, in consultation with the organizers.

Of Craft and Credibility: Rural Artisans, Global Networks, and the Export of Traditional Knowledge. *Anita Chan, University of Illinois*

In 2006, Peru's government awarded an intellectual property title known as a Denomination of Origin to the traditional ceramics made by artisans in the town of Chulucanas. The move was celebrated by the state as a culturally-sensitive strategy for regional development that promised to preserve cultural traditions and heritage of native populations, while at once preparing those populations for the modern, export-oriented, information-based economy. This study draws from an ethnography of the initiative, and explores the means by which state efforts strive to retrain traditional craftsmen in the techniques of global entrepreneurship. Central to such reformations is the channeling of new forms of design and market expertise that aim to remake artisans into subjects that embody less provincial craftsmen and more market-savvy entrepreneurs able to skillfully navigate the global market. And while less visible, crucial to such reforms too are the new cultivations of cunning, craft, and credibility as practiced by the exporting artisan.

131. Ethnographies of the Urban. The Epistemological Offerings of Science Studies

10:45 to 12:15 pm
13: 1312

It is often assumed that buildings reflect societies; planning systems embody politics, urban networks follow cultural patterns. Challenging the usual epistemologies of social sciences, Science and Technology Studies (STS) offer a different understanding of what it means to supply a "social explanation" of architectural design, buildings, cities and urban space. The session discusses the potentials and challenges of Science Studies to provide new methods of enquiry in architecture and urban studies: How are STS methods "transportable" to other fields of material practices? What are their epistemological offerings? To illustrate the particular contribution of STS to the understanding of the urban, the session includes papers that base their findings on extensive fieldwork.

Participants:

Kuma Kengo. An unconventional monograph. *Sophie Houdart, CNRS*

Sophie Houdart, CNRS, Laboratory of Ethnology and Comparative Sociology, France Sophie.houdart@mae.u-paris10.fr This is about the ethnography of an architectural studio - the one of the Japanese architect Kengo Kuma - that turned eventually, on the request of Kuma himself, into an unconventional monograph. I suggest the hypothesis that if it is more than merely a way with words, if something is recognisable in "Kuma's architecture", then it should be possible to see it at work in the practice, in the routine. I also suggest the hypothesis that the materiality upheld by Kuma had something to do with the materiality in the practice (wood, polystyrene, paint, glue, pixels) - in other words, that what the architect is working with is part of his architecture, or, to put it differently, that the architecture he creates is related to the media of its conception. One of this book's concerns, then, is with recomposition - how does one not lose sight of Kuma and the singularity of his architecture in the midst of so many details recorded every day?

The recalcitrance of risk in urban space: How risks shape urban space. *Valerie November, EPFL*

Valerie November EPFL, Switzerland valerie.november@epfl.ch This paper aims to describe the role of risks in urban spaces. From a deliberate broad definition of risk (something potential, that hasn't occurred yet, but that we foresee might become harmful to individuals or communities in one or several areas), we consider the different translations (Latour 2005; Callon 2001) that are involved when it comes to dealing with risk issues. Following these translations leads us to analyse the assemblage consisting of human and non-human elements that risk issues help to configure. One of the key elements of these assemblages is the metric that actors use and that helps them to argue for the existence of risk issues. The paper focuses on different case studies, such as floods and risk of fire, for which assemblage and translation processes are described. Finally, using these concepts helps us to understand the multi-faceted spatiality of risk. Unlike disasters, risks are virtual threats, even though manifestations of risks have very real consequences. Consequently, the main challenge is to understand the concept of risk as it is defined and

used by practitioners, and then to recognize the role risks play in transforming the collective (Latour 2005). Only then will it become possible to grasp all the complexities of the relationship between risk and territory - and the recalcitrance of risk in space, and only then will the spatiality of risk help to improve our understanding of how to manage the risks that are so characteristic of contemporary societies.

Flash Mob Ethnographies of the Urban. *Laura Forlano, Cornell University*

Laura Forlano Cornell University, USA lef55@cornell.edu This paper will present findings from a series of three "Flash Mob Ethnography" sessions, which were held as part of Breakout! Escape from the Office, a collaborative team design intervention that was funded by The Architecture League of New York as part of the Toward the Sentient City exhibition in September 2009. Over the past three decades, we have seen the expansion of open source forms of production and more collaborative forms of organizing in areas from software to carsharing, coworking and cohousing. As social scientists working in science and technology studies, it is imperative that we develop appropriate methodologies for the study of socio-technical systems and use information and communication technology to develop more collaborative ways of conducting our own research. To address this need, "Flash Mob Ethnography" sessions were conceived of as a way to introduce more collaborative forms of data collection, analysis and writing to studying people, technology and the built environment in urban settings. During the first session, three teams set out to conduct research on the evidence of the economic crisis in the Union Square area in New York. In the second session, "Flash Mob Coding and Analysis," which was held approximately two weeks later on Columbus Day, as the Italian-American parade marched down 5th Avenue, about eight participants met at the Sony Public Atrium in mid-town Manhattan to code and analyze the over 250 photos that had been taken during the earlier session. A number of interesting themes emerged from the research - advertising campaigns that echoed narratives about the recession, the use of empty storefronts as pop-up shops and campaign headquarters, the swift takeover of many bank branches by Chase, and the decline of the old economy and the rise of the digital economy (Virgin Records, one of Union Square's most recognizable landmarks, had closed yet the majority of young people in the area could be seen with white Apple iPod earbuds protruding from their pockets, purses and persons). During the final session, exactly five days after the coding session, a small group of three gathered first at The New School and then at a café before moving to a Parsons studio space where they held a "Flash Mob Writing Sprint," collaboratively writing a 1000-word blog post. This paper is a critical reflection on the role of ethnographic research methods in studying socio-technical systems including urban environments and the built environment. It is most relevant to panels on theory and method, information and communication technology and the urban, architectural and built environment. The purpose of this paper is to share findings, strategies and images from the initial implementation of the "Flash Mob Ethnography" sessions. The sessions are currently being customized for implementation with community groups in Barcelona and New York as part of collaborative projects with Citilab and Parsons' Design for Sustainability and Social Innovation.

Is STS transportable? Answers From Architecture Fieldworks. *Albena Yaneva, The University of Manchester, UK*

Albena Yaneva The University of Manchester albena.yaneva@manchester.ac.uk The paper discusses the potentials of STS to tackle the specific knowledge practices related to architectural design. How long can we extend the list of non-humans that would enter in the actor-networks: scallops, bacilli, Portuguese ships, sick bodies, African elephants so as to be able to add urban plans and design projects? What are the epistemological offerings of Science Studies to Architecture and Urban Studies? How are the STS methods and findings "transportable" to other fields of material practices? What are their chances to provide new methods of enquiry in architecture? What kind of understandings of cities, buildings, and urban design can be inspired by STS accounts? The paper provides answers to these questions based on extensive fieldwork in several architectural practices. I follow in an ANT fashion what architects, urban planners, designers, engineers, and clients do in their daily routine actions, in spite of their interests and theories. I describe urban practitioners acting in the studio and outside of it, track the nets of their work, the way their actions spread and the way they make sense of their world-building activities, the routines, the workaday choices usually considered of lesser importance for judging the meaning of design.

132. Quantitative Studies on Science and Technologies

10:45 to 12:15 pm

13: 1321

Participants:

Analysis of patent citations of scientific articles and its implication from STS perspective. *Masashi Shirabe, Tokyo University of Agriculture and Technology*

Analysis of patent citations of scientific articles has become more important than ever. That is because there is a boom or hype of science-based innovation and because there is a strong requirement that research investments have to be accountable. Then, scientometrics and/or innovation study researchers are seeing strong policy makers' needs for comprehensive analysis of patents, which comes mainly from our current econo-political setting. "Researchers studying innovation increasingly use indicators based on patent citations. However, it is well known that not all citations originate from applicants — patent examiners contribute to citations listed in issued patents — and that this could complicate interpretation of findings in this literature." (Alcácer et al., 2008) An US patent document contains a lot of bibliographical data like ID, registration date, abstract, references to US/foreign patents as well as other references. The last category ("other references") is a category which includes patent citations of scientific articles. Although most bibliographical items listed in patents have their well-managed formats, other references are unformatted and unindexed data. For analyzing patent citations of articles, we had to construct an indexed dataset from USPTO data with difficulty. In our database, patents issued in 1995-2005 were categorized into 27 industrial fields by using IPC sub classes, and cited articles were indexed by journal titles. For indexing them, journals listed on Journal Citation Report (JCR) and their predecessors were used. Those journals were grouped into 172 JCR science categories. Due to the limited coverage of JCR journals and other technical problems, 90% of articles cited were attributed to JCR journals. In this paper, using a dataset described above, I will analyze differences between examiners' citations and applicants' citations of scientific articles, especially, focusing on "cultural" differences. That is, I will compare examiner/applicant citations by applicant nations. As USPTO started to report examiners' and applicants' citations separately in 2001, data are limited to USPTO patents in 2001 - 2005.

How do Emerging Technologies Conquer the World: Patterns of Diffusion, Differentiation, and Transformation into Research Technologies. *Loet Leydesdorff, University of Amsterdam*; *Ismael Rafols, SPRU, University of Sussex*

Grasping the fruits of "emerging technologies" is an objective of many government priority programs in a knowledge-based and globalizing economy. However, what is considered as "nanotechnology," "genomics," etc. varies from different perspectives and changes over time. In this study, we focus on two more fine-grained—and therefore specific—emerging technologies: (1) small interference RNA (siRNA) and (2) nanocrystals. The first one, triggered by a publication in Nature in 1998, has huge promises for therapeutic interventions in the DNA (Sung & Hopkins, 2006), and the second (with substantial numbers of publications since the mid-1990s) will find applications, among other things, in solar cells. In both areas,

specific patents emerged during the 2000s. How do such emerging technologies develop? In recent years, instruments have become available for measuring the spread of publications both geographically and in the socio-cognitive space of publication patterns. In this study, we further develop socio-cognitive and geographical maps of techno-scientific developments as baselines against which one can measure diffusion patterns. The expectation is that new developments will first be developed in a specialty area along a trajectory although the participation of authors may exhibit geographical spread. In a next stage, the development begins to diffuse also socio-cognitively. In the geographic dimension one then can expect the development of a core-periphery structure as an oligopolistic regime. While the socio-cognitive development thus is transformed into a research technology on which patents can be based, control remains heavily dependent upon further scientific developments (Shinn, 2005). We operationalize these theoretical questions in terms of the scientometrics. The distinction between nations and disciplines as analytically independent dimensions for the evaluation can be developed into different baselines for the mapping (Small & Garfield, 1985). We elaborate on "the global map of science" (Leydesdorff & Rafols, 2009; Rafols et al., forthcoming) as a possible baseline in the socio-cognitive dimension and use overlays to Google Maps for the geographic dissemination (Leydesdorff & Persson, in preparation). Since the data (harvested from the Science Citation Index for each year on the basis of an informed search string) are brought under Pajek in both dimensions, we can study centralization tendencies quantitatively and provide them with an interpretation.

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How does the researchers' migration influence national production of knowledge?

Yasuhiro Yamashita, Yamagata University / National Institute of Science and Technology Policy

Although the researchers' migration is one of the important issues of science, technology and innovation policies, quantitative studies on its effect have been done scarcely because of absence of systematic data. We attempt to analyze it based on the biographies of researches that accompany their research articles. For the analysis, three journals published in four periods; 1991, 1996, 2001 and 2006, by the Institute of Electric and Electronic Engineers, Inc. (IEEE) are used. The impact factors of these journals in their respective fields were the highest or second highest in 2002 ("IEEE Trans. Pattern Analysis and Machine Intelligence" (TPAMI), ranked the highest in the discipline of "Computer Science, Artificial Intelligence"; "IEEE Trans. Robotics and Automation" (TRA), ranked the highest in "Robotics"; "IEEE Trans. Semiconductor Manufacturing" (TSM), ranked the second highest in "Engineering, Manufacturing"). We regard the countries in which the universities the researchers graduated from were located, or the countries of birth as their country of origin. To avoid overrating multi-authored articles, each author's contribution to an article is equally counted as one divided by number of authors. Amount of articles is counted both by the country in which researchers' institutions locate (NA) and by the country of researchers' origin (NO). The U.S. shows the highest shares of NA and NO in all journals and periods, however, the shares of NO are remarkably lower than that of NA. This means the U.S. accepted many researchers from abroad. Meanwhile, the analysis of NA and NO reveals that researchers of Chinese and Indian-origin have published a lot of articles in foreign countries, especially in the U.S. While Indian researchers have tended to publish research articles entirely in the U.S. through the all periods, Chinese researchers have changed their tendency; they have increased domestic article production to some extent. On the other hand, Japanese researchers rarely migrate to other countries. Generally, the articles of TPAMI and TRA have been produced by both migrated and domestic researchers evenly for the all periods, that of TSM have been mainly produced by domestic researchers. Finally, we discuss the limitations and potentials of our analysis based on biographies. Biographical data sources available for bibliometric studies are very few, therefore, selection of target disciplines and amount of samples are inevitably restricted. Despite these limitations, researcher biographies contain valuable information on invisible structures of knowledge production which can not be grasped by ordinary bibliometric analysis.

Does the current university system flourish the diversity of research? : Quantitative analysis of the Japanese university sector.

Takayuki Hayashi, National Institution for Academic Degrees and University Evaluation

By the introduction of the concept of new public management in the 1990s, "marketisation" of university sector has been promoted throughout the world. Research funding shifted its weight to the competitive ones from the block grants and parts of block grants begun to be distributed by performance evaluation. These transitions would lead to more concentration of research activities into the small number of the universities under the keywords "selection and concentration". In Japan, opposing this political phenomenon, academics sometimes insisted the importance of the "diversity of research". However the discussion lacks enough evidences. Although about half of the funding goes to the seven largest universities, it is unclear who has contributed the diversity of research. It is also unclear what kinds of strategy universities has taken in the decade of marketization, for example, whether medium or small universities concentrate their resources into some research fields to build the "center of excellence" which could compete against large universities. This study analyses the transition of the diversity of research in the university sector in Japan using two types of data (funding and publications) to show who has contributed diversity. From the funding analysis, the firm internal consistency of the hierarchy of universities is observed. The result shows the funding ranking of faculty/school level correlates to the funding ranking of university level, which means it is not often that the not top-level university has some prioritized faculties/schools with high competence. This stabilization of structure might reinforce the concentration of competitive fund into small universities in many research fields. Form the analysis of the publication in two databases (Web of Science, and JDreamII in Japan) over 10 years, the index of concentration (Herfindahl index) of publications among universities has not radically changed in many research fields. Although the correlation can be seen between the Herfindahl index and the rate of publications produced by the seven largest universities, there are some research fields which has high concentration into small universities other than largest ones like fisheries, veterinary medicine, some fields in social sciences and humanities. In the growing fields, which has high increase rate of publications in the decade, the concentration index has decreased but the share of seven universities also increased. This shows that the growth of research fields has realized by two mechanisms simultaneously: the spread of research fields to many universities, and the high pace of capacity-building in the largest universities. The analysis of diversity of research fields within a university using JDreamII data shows the slightly increase of concentration within some large universities and the decrease within some

medium-size universities. It shows the largest universities can take strategic distribution of resources within the universities, the medium university do not take radical prioritization. These results show that some research fields would be played in the not-largest universities in the emerging stage. But in developing stage the largest universities has a role and medium-size universities lack the way to scale up within them.

Worldwide patterns of specialisation in scientific output, 1992-2008. *Edwin Horlings, Rathenau Institute, Department of Science System Assessment; Peter Van den Besselaar, VU University Amsterdam & Rathenau Instituut*

Understanding why some countries have higher S&T performance than others -overall or in specific domains- is a key issue in S&T policy. In this paper we compare the science systems of 205 countries in three benchmark years (1992, 2000, and 2008). In our view, most international comparisons of S&T performance lack resolution, while in-depth case studies are of limited scope. We add a dimension by providing a high-resolution, global view of national patterns of scientific specialisation and relate those patterns to the salient features of science systems, nations, and polities. The results will deepen our understanding of international differences in S&T performance. We use publication data from the Web of Science (WoS) as a proxy for resource allocation in science, as the ultimate outcome of agenda setting in a complex adaptive system. Resources are by definition scarce, so any allocative decision at some level involves an assessment of opportunity costs. As such, specialisation patterns reveal the comparative advantages of science systems. The specific nature of those comparative advantages will be examined. Hypotheses Three hypotheses will be tested: 1.Larger science systems have greater capacity for diversity. 2.Countries cluster according to patterns of scientific specialisation. 3.National patterns of specialisation reflect comparative advantages and resource scarcities in science. Prior to testing the hypotheses, we put the data through rigorous statistical analysis to test our main assumptions. Analysis and results An analysis of the aggregate degree of specialisation in national S&T output clearly shows a strong relationship between the size and output diversity of science systems. Upon closer examination, it appears that the first hypothesis has to be reversed: smaller countries have lower diversity, as a lack of resources forces them to specialise. We have used factor analysis to cluster 205 countries on the degree of similarity in their output structure. Sensitivity analysis was applied to arrive at robust estimates. The result was a limited number of coherent clusters in each benchmark year. Longitudinal analysis shows a number of significant changes, most notably the rise of the emerging economies with a highly specific specialisation pattern and -in the most dynamic economies- more pronounced specialisation than would be expected based on their size; the emergence of a small group of former Soviet Republics, locked into an obsolete specialisation pattern; and a fundamental disconnect between scientific specialisation patterns in North and South. The results will be combined with data on the salient properties of country clusters, which brings us closer to identifying the nature of comparative advantages in science. Separate analysis of conference proceedings as distinct from journal articles helps us distinguish work on the interface between science and industry from work in the domain of formal science. Finally, comparative case studies of S&T policy in the most prominent representatives of each cluster provide a narrative of the link between comparative advantage, resource scarcity, S&T policy, and national patterns of scientific specialisation.

Discussion on the Relationship of Academic Quantitative Evaluation and Frequent Academic Cheating in China. *Yuhong Xiang, Chinese Academy of Sciences*

International academic journal Acta Crystallographica Section E announced on its website on December 19, 2009 that they repealed 70 counterfeit articles on the journal once and for all and piped off Jinggangshan University. These 70 articles are authored by two lecturers Zhong Hua and Liu Tao from Chemistry College and Engineering College of Jinggangshan University respectively. Academic cheating is one of the big reasons that restrict research accomplishments in Chinese academic community. With this case study, people can learn about academic quantitative evaluation which is one of the important reasons for the appearance of academic cheating in the Chinese colleges and universities and academic community. How to define academic quantitative evaluation? Academic quantitative evaluation is to check which publication the papers are on or the quantity of papers as the standard but not value of the academic results to appraise the job title and promotion. The paper can be a reference to some extent for Chinese government departments to formulate and modify relevant administration regulations and punishments for academic improper. The paper provides in-depth views followed with the case study. The main views in the paper are: 1. it is important to keep academia clean with punishment of academic improper by means of judicature if necessary. For plagiarism in the academic cheating cases, procuratorial organ should be involved in for investigation. Plagiarism is against Intellectual Property Law. Additionally, it defrauds a great amount of scientific research state funds, which is also constitutes fraud. 2. Our colleges and universities and academic community should learn that water down administration intervention capacity, change administration-oriented resource setting, return to academic quintessence, implement administration of academic quintessence and set up academic community values are right approaches to keep academia clean.

133. Conditions of Impossibility: The Uses of Non-Knowledge

10:45 to 12:15 pm

13: 1322

In what contexts does it become necessary to keep knowledge secret? How do strategic and tacit foreclosures in access and communication function to protect, exploit, or erase contributions or forms of participation in global regimes of knowledge and value? Science studies scholars often find themselves attempting to make visible the invisible: tracing networks, revealing practice, and opening the 'black box' of the production of science. Yet knowledge may not always be power. There are circumstances in which power comes from the exploitation of ambiguity or deliberate evasion of precision. A disease about which little is known can be framed as a threat; a research endeavor that has not reached its conclusion contains the possibility of generative imagination; statistical models or abstractions may circumvent messy discussions of responsibility and blame while achieving a desired technocratic outcome. This panel seeks both empirical and methodological papers exploring the phenomena of 'non-knowledge' as it is experienced in the negotiation of regimes of expertise. Science studies, as a form of engaged scholarship, is not itself excluded from this reflexive analysis; we seek out spaces of silence and stumble across information that has been lost or hidden. How do we negotiate the knowing exclusion of data? What tools do we have for talking about what cannot ? for a range of institutional, political, and ethical reasons ? be included in our formal, published scholarship? Is our task to unveil what has been concealed, or are there occasions when the maintenance of non-knowledge should be our goal? Papers will reveal, explore, interrogate the forces, human and non-human, individual and collective that block possibilities for knowledge-making and which enable the maintenance of aporias in knowledge and enable them to travel with powerful consequences. Inquiring about the forces that 'culture' knowledge means also calling attention to scenarios where certain forms of expertise or kinds of evidence are dismissed, blocked, or devalued. This panel has been organized on behalf of the Science, Technology and Medicine working group of the Society for Medical Anthropology.

Participants:

Filling the 'Knowledge Gap' - The Work of Translating Research into Clinical Practice. *Adam Baim, University of Chicago*

Contemporary biomedicine hinges upon systems of exchange between research and clinical practice. Research/clinic interfaces have received much attention with the emergence of translational medicine, a field which aims to facilitate the development of drugs, technologies, and patient-care standards 'from bench to

bedside.' Although the paradigm of translation is now pervasive, the boundary work undergirding this translation remains largely unspecified and generates important questions for the anthropology of biomedicine/STS. This project focuses upon a group of physicians who gather weekly to discuss findings from recent clinical trials. The group debates which studies have the greatest bearing on clinical medicine, and then summarizes studies that it believes warrant a change in how physicians practice. These summaries are ultimately published in one of the most widely read journals in the specialty. While far removed from the bench sciences - where the majority of funding for translational medicine has been allocated - this group's work plays an equally crucial role in the translation of research into practice. Having completed several months of participant observation and interviews, I discuss the kind of clinician subject upon which this group's work - and the broader process of translation - is conditioned. First, members adhere to disciplined forms of reading as they attempt to appraise clinical evidence for its validity, relevance, practice-changing implications, and feasibility of clinical implementation. Summaries are written with a structure that mirrors this review process, in hopes of equipping physicians on the ground with the same reading stance performed within the group. I argue that the reading of research texts, just as much as the reading of bodies, is essential to the style of clinical practice envisioned by translational medicine. Second, determining the clinical relevance or practicability of evidence demands of members a certain 'intuition,' one comprised chiefly of archiving and remembering: to evaluate whether a new finding would meet these criteria, members must access their aggregated memory of past experience and project it toward a clinical encounter in the hypothetical future. This projection, which follows a characteristic discursive pattern during group meetings, gestures toward archiving and remembering as key to how physicians navigate the boundary between research and the clinic. The principal motivation of this group is to fill in areas of non-knowledge. It imagines a specific kind of 'knowledge gap' between research literature and physicians, and seeks to remedy this gap by communicating findings in a simple, actionable format. At the same time, the group attempts to engineer a community of physician-readers who can more directly engage with research literature. The group also offers a space where clinical intuition - an obscured type of knowing that is difficult to teach, and inaccessible to conventional biomedical research techniques - is harnessed for translational ends. Such notions of inaccessibility help solidify the purpose and influence of the group. This paper contributes to the field a novel account of the clinician subject required by translational medicine, and frames efforts to cultivate this subjectivity as intervening in a particular variety of non-knowledge."

Non-Knowledge and the Regulation of Air Toxics in the United States. *Karen Michele Hoffman, University of Puerto Rico*

I identify different instances of omission of knowledge in struggles regarding prohibition and permitting of hazardous air pollutants (air toxics) in the U.S. from the 1970 Clean Air Act to the present, as well as the failure to produce knowledge needed to protect public health from air toxics. With the toxics provisions of the Clean Air Act of 1970, Congress required the Environmental Protection Agency (EPA) to regulate air toxics to an extent that provides safety with respect to human health, without considering the financial effect of the regulations on the owners of the industries to be regulated. Congress, thus, ignored the knowledge that the industry owners would be displeased and likely to take legal action. Industry owners brought lawsuits, contesting the science supporting the new regulations and pushed for criteria for action that would be impossible to meet. In doing so, they ignored the knowledge that their practices were harming public health. EPA allowed the industry lawsuits to stymie its work of putting the law into practice. The EPA's goal became finding a way to implement the law that the industry owners would not petition. This goal displaced Congress's requirement of regulating air toxics to an extent that provides safety with respect to human health, without considering financial effect. The agency accomplished this goal by considering the financial effect of the regulations on the owners of the industries to be regulated, and revising its proposals accordingly. How did EPA manage to satisfy the demands of both Congress and industry owners? EPA did not do so by producing knowledge about the financial harm that would be caused to the industry owners, nor ways to mitigate that harm, such that both sets of demands might be addressed. Instead, EPA swept under the rug certain pieces of knowledge: that the regulations did not provide safety, and that the agency had considered the financial effects of its regulations on industry. Acutely aware of this hidden knowledge, environmental advocacy groups brought lawsuits against the EPA. By 1987, the D.C. Circuit Court ruled in favor of EPA's approach to implementing the law. With this decision, like EPA, the Court failed to require examination of the financial harm that would be caused to the industry owners and ways to mitigate that harm, such that both Congress's requirements and the concerns of industry owners might both be addressed. The decision also avoided discussion of the knowledge that EPA's regulations would not provide safety. By 1990, the new goal - regulating to an extent that industry will not sue - became Congress's requirement regarding air toxics, replacing its earlier requirement of providing safety with respect to human health. In the past forty years of air toxics regulation, there has been much effort put into undermining knowledge about harm to public health, much ignoring of public health and private financial needs that require consideration in setting standards, and little or no production of knowledge needed in order to engineer industrial processes that do not create toxic air pollution.

Keeping bodies apart: the spatial (re)framing of not knowing. *Fadhila Mazanderani, University of Oxford*

The 'coordination' work involved in making a multiply materialised body 'hang together' has been explored in some depth in science and technology studies (Mol, 2002). Far less, however, has been said about the practices that are employed in order to ensure that the material multiplicity of a body is maintained; the 'coordination' work involved in 'holding' the body multiple apart rather than 'hanging' it together. Drawing on ethnographic data from research on the information practices of HIV positive women who emigrated from sub-Saharan Africa to the UK, this paper will analyse the practices these women employ in order to manipulate knowledge about their illness and in so doing construct alternative spaces of possibility in which they can enact a body that is simultaneously with and without HIV. The paper will focus on how patients, in response to an HIV positive diagnosis develop epistemic practices of not knowing that enable them to hollow out spaces of ontological flexibility as a means of coping with their 'embodiment' of a stigmatised disease. Two perspectives on the productive power of not knowing are developed in this context: controlling the reception of knowledge (not wanting to know for oneself) and controlling the dissemination of knowledge (not wanting others to know). What emerges as especially relevant in both these strategies is how practices of not knowing-as articulated through tactics of containment and curtailment, silencing and forgetting-are constituted by and in turn constitute different spaces of HIV treatment and care that are both local and global. This continuous spatial (re)framing of what it means to be HIV positive is crucial to the above mentioned work of 'holding' a body apart. The proposed paper will explore how this work of maintaining the multiplicity of such bodies takes place across three different physical and conceptual spatial divisions: the HIV clinic versus the GP practice; the internet versus community support groups; and home in Africa versus home in the UK. Mol, A.-M. (2002). The Body Multiple: Ontology in medical practice. Durham, NC, Duke University Press.

Chair:

Joanna Radin, University of Pennsylvania

134. Innovation in STS: Method and Scale in Sociotechnical Imaginaries - Part II

10:45 to 12:15 pm
13: 1331

Despite the rapidly growing interest in the politics of science and technology in recent years, STS scholarship has devoted relatively little effort to theorizing the relationship of science and technology to mechanisms and institutions of political power. In order to fill the gap, the concept of "sociotechnical imaginaries" has been proposed, which we define as "collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific technological projects." By placing the mutually constitutive nexus of science, technology, power, and culture at the center of analysis, this concept has proved quite useful in rethinking the politics of science and technology. However, there still remain many challenging questions about how to empirically identify sociotechnical imaginaries and methodologically investigate them. How and at what levels do those imaginaries emerge and get institutionalized? How do they move from sub-national to national level or vice versa? Once they are firmly established at the national level, how do they, if at all, travel across national boundaries or become global? Are there cultural disparities in the formation and institutionalization of sociotechnical imaginaries—for instance, between the West and the East? And how do different disciplinary methods respond to the above questions? The aim of this double-session panel is to assemble a variety of empirical cases from Asia, North America, Europe and beyond, and to use these cases to reflect upon the questions of method and scale in exploring and analyzing the concept of sociotechnical imaginaries.

Participants:

From the National to the Local: Scale and the Sociotechnical Imaginary of the Cooperative in Indonesia. *Suzanne Moon, University of Oklahoma*

This talk explores the question of scale in the framework of the sociotechnical imaginary. Jasanoff and Kim have defined the sociotechnical imaginary as "collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific technological projects." This paper examines how the sociotechnical imaginary might be used to illuminate the longer term significance, or afterlife, of abandoned national policies, a situation in which the movement from national to subnational actors and scope of action must be considered seriously. A crucial methodological challenge is how to analyze the shift from state actors operating on a national stage to independent, local actors who use the imaginary to inform projects of dramatically smaller scope long after the demise of the original policies. The story I will briefly examine is that of cooperatives in post-colonial Indonesia. The technological dimensions of this story have usually been overlooked, in part because both Sukarno and Suharto gave little more than lip service to the idea of the cooperative as a serious instrument of technological development. However, my research indicates that the project of cooperative development in Indonesia was powered by a clear sociotechnical imaginary, one that reappears among local activists in Suharto's Indonesia and in post-authoritarian Indonesia. Aside from investigating how to trace the action of an imaginary in time under these conditions, I will inquire whether it is sensible to view the sociotechnical imaginary as an agent of continuity in the face of interrupted or defunct policies, and in the process consider the implications of the dramatic differences of the scale of operation of the imaginary for the shaping of the national technical and social order in Indonesia.

Problematizing the "National" in National Sociotechnical Imaginaries: The Case of South Korea. *Sang-Hyun Kim, Hanyang University*

While science and technology are ubiquitously embraced by modern states as driving forces for progress and prosperity, their construction in any given context is almost always closely intertwined with a particular imagination of nationhood and national history. Science and technology are not just mobilized—materially and symbolically—in the (re)imagining of nations in the sense proposed by Benedict Anderson. As Jasanoff has repeatedly pointed out, the contents, meanings and purposes of science and technology, the public good they should deliver, and the roles and identities of the state, scientists and technologists, and publics are also all simultaneously (re)imagined (or co-produced) in that process. The notion of "sociotechnical imaginaries" can help us examine the ways in which these constellations emerge and become stabilized or contested, and compare how they vary from one country to another. On the other hand, the focus on "nationally specific" sociotechnical imaginaries may well divert attention away from the very idea that nation, or nation-state, is itself constructed and hybrid and requires hard socio-cultural, political and material work to be maintained. Ironically, this may in turn lead to an overemphasis on the translocal or transnational scalability of sociotechnical imaginaries. By using the selective episodes of South Korean controversies (e.g., debates on nuclear power, energy policy, and stem cell research), the present paper explores a more nuanced approach to "national" sociotechnical imaginaries (and their relations to the "nation-state"). South Korea's unique imagination of the role and place of science and technology in society has embedded—and been embedded in—distinctive, collectively shared ideas of nationhood, the state, and development. The paper suggests, however, that while the resulting sociotechnical imaginaries are powerful at the level of nation and nation-state, their boundaries are often diffuse, fragmented, and contentious.

China Biotech: on Governance, Risk, and Citizenship. *Nancy N Chen, University of California, Santa Cruz*

This paper explores ways in which the biosciences in contemporary China frame cultural beliefs and meanings of biosecurity. We will analyze the double helix of state and market in formations of Chinese biotechnology over the past decade to address questions of scale and methods of study. In 2002, scientists from the Beijing Genomics Institute surprised the world scientific community by publishing the Indica rice genome sequence. Large scale production of genetically modified (GM) rice may soon join GM cotton (while GM soy is imported from the U.S.) despite concerns for GM rice products already present in Europe. The projections of China as a major pharma producer and scientific force in the 21st century are juxtaposed against a backdrop of extensive concern for tainted food or fake medicines. Governance of contamination such as melamine laced pet food, diethylene glycol infused toothpaste, or unregulated heparin production entails complex tracking of local production and global commodity chains. National stories of endangerment, vulnerability, and concerns for purity in food and drugs reflect ongoing reframings of citizenship and increased risk from consumption. With rising fuel and food costs as well as increased riots, the politics of consumption will be examined in relation to the sociotechnical imaginaries of biotechnology.

Performing Trust at the Fault Lines of Glocal Science. *Sharon Traweek, UCLA Women's Studies & History Departments*

Some STS work has assumed an agonistic field of interests while paradoxically neglecting power. Rational actor models abound in STS, even though they have been undermined in many fields for decades. When I tell scientists that some STSers claim trust is unimportant in large, well-organized collaborations: the response is always laughter. Since the 1970s social and biological scientists have examined altruism and the study of commons has intensified in law, history, anthropology, and other fields; meanwhile, many have studied ethical practices in various communities. This basic research on altruism, commons, and ethics is already being used to make policies. For many decades anthropologists have argued that naming, jokes, stories, and gossip [NJSG] are significant practices for understanding any group's ethos. NJSG are intimately entwined with evaluating research styles, aesthetics of research design, and ambiguities in making knowledge. All these phenomena, including trustworthiness, are constituted, transmitted, debated, and revised via NJSG. Forms of NJSG shift with gender, generation, and locality, while access to NJSG is restricted in multiple ways. NJSG practices are a crucial part of any community of shared practices Size matters: costs escalate for the new infrastructures; distributed research communities are imploding as new kinds of global laboratories are being designed and constructed. Trust

matters as trans-local clusters merge and morph. The multi-cultural strategic actors who are continuously negotiating a shape-shifting glocal consensus usually are men. I have argued that crucial negotiations occur at fault lines where different kinds of researchers come together to develop new strategies about what they come to see as new, shared problems, willing to redefine research and infrastructure. Those ruptures and gaps are filled with NJSG, building trust, commons, and new exclusions. In my talk I will discuss how to examine NJSG in such sites.

Chair:

Ulrike Felt, University of Vienna

Discussant:

Ulrike Felt, University of Vienna

135. Crossing Boundaries between Machines, Animals, and Humans

10:45 to 12:15 pm

5: 511

Participants:

Translational devices and biological machines: Testing the boundaries of the nano-biological. *Mary Ebeling, Drexel University*; *Paolo Milani, Physics, Centro Interdisciplinare Materiali e Interfacce Nanostrutturati (CIMAINA) Universita' di Milano; and Filarete Foundation*

As "lab-on-chip" and similar, diagnostic medical micro- and nanodevice technologies are promoted as some of the early success stories of the so-called nanotechnology revolution, this paper explores the social, economic and political forces that shape the development and deployment of these technologies in postindustrial, globalized settings. These devices embody more than the scientific and engineering knowledge that went into their realization; they are, as well, the embodied ambivalence of the boundaries between the biological and the technical. The devices discussed in this paper enroll bacteria "living robots" to construct the nano-components, use bacterial flagella to create nanofluidic pumps, push DNA strands through porous polymers, and entice living cells to cling to inorganic surfaces. Using an ethnographic approach, we explore the translational work done by scientists, engineers, doctors, technicians, and investors in order for these devices to be commercialized and embedded into laboratory practices or deployed into the human body. Attention is given, as well, to what these devices mean for the developmental success of nanobio, biomedicine and translational science as economic sectors for two postindustrial regions: Philadelphia (USA) and Milan (Italy). Within the paper, we comparatively focus on two medical devices, one that has been transferred from experimental settings into a scalable industrial context and used in hospital diagnostic laboratories; the other device still in experimental stages, using the biological materials of bacteria to both construct the device as well as "motorize" it. How do material scientists interpret the behavior of cells in vitro in order to translate the success of the device? How do physicists translating these devices understand the labor practices of technicians working in hospital labs within which these devices will be integrated? How does a mechanical engineer direct living, bacterial robots to perform micromanufacturing labor? What is the translation work that is performed between laboratories and industrial manufacturers? Where does the "biological" end and the technical begin within these devices, within these laboratories, within these commercialized, biomedical machines? This paper is based on a year-long, collaborative research project conducted in Philadelphia and Milan by a sociologist and a physicist investigating the translational work of actors building and commercializing microfluidic devices. This research contributes to the larger bodies of scholarship in science and technology studies that address the development of biocapital, particularly through biotechnologies and the commodification of biological material (Rajan 2005, 2006; Rose 2006; Scheper-Hughes 2003, 2005; Waldby and Mitchell 2006), the problems of replication and scalability in science, with particular focus on nanoscience and nanotechnologies (Collins 1985), and translational, epistemic cultures (Hogle 2009; Kleinmann 2003; Knorr-Cetina 1999).

The Boundaries of Cleanliness: Animal Bodies in Xenotransplantation. *Peta S Cook, University of Tasmania, School of Sociology and Social Work*; *Nicholas Osbaldiston, Queensland University of Technology*

The medical success of allotransplantation (human-to-human transplantation) has lead to increasing demands for healthy human body parts. This has resulted in a shortage of suitable transplantable organs worldwide, and therefore significant discrepancies between organ need and supply. Significantly, this limitation in supply means death may occur before a suitable human organ is found. It has been proposed that xenotransplantation (animal-to-human transplantation) could bridge this divide. To provide a potentially inexhaustible and on-demand supply of animal organs for human need, however, xenotransplantation would require large 'specially bred' animal stockpiles. Much effort and time has therefore been invested in creating 'clean' animals for xenotransplantation. These animals, which may possibly be genetically engineered and/or cloned, are housed within specific-pathogen free (SPF) laboratory spaces that only the sufficiently trained can access. Drawing upon the vast literature on xenotransplantation, we analyse on how different animal bodies and animal parts are constructed. Influenced by Douglas' (1966) work, we demonstrate how the selection of a source animal classifies different animal species as safe or unsafe. This creation of boundaries extends into the source animal of choice, pigs, whereby certain pigs are viewed as 'pure' while others as 'polluted'. Thus, the cleanliness and purity of laboratory pig stocks contrasts with the unclean animals, humans, and spaces that exist outside of such environments. However, while such boundary work symbolically maintains divisions between human/animal and animal/animal, xenotransplantation also challenges these boundaries materially by directly implanting 'pure' living animal parts into an 'unclean' living human body. Thus, we explore the construction of the dirty and the dangerous with regard to animals in xenotransplantation, and how the creation of such boundaries is centred on avoiding contamination. These rituals, focused on purification, serve to reinforce the boundaries between humans and animals, while also challenging them. Consequently, this analysis provides novel insight into the scientific manufacture, housing, and medicinal harvesting of animal bodies within this technoscience, and into animal/human relations in general.

The Mouse Multiple: Managing the Care of Mice in a Behavior Genetics Laboratory. *Nicole Nelson, Cornell University*

The history of model organisms such as the mouse has been shaped by the interaction of many actors, including scientists as well as hobby mouse breeders, governments and mouse diseases. This paper, which draws on my ethnographic work in a behavior genetics laboratory, looks at how scientists and "non-scientific" actors interact around the mouse in the knowledge production process. I will focus specifically on the management of animal housing, where mice are bred and kept prior to, in between, and sometimes during experiments. In contemporary animal behavior genetics, increasing focus on the way that environmental factors impact mouse behavior has eroded the boundaries between the animal care facilities and the experimental spaces, bringing scientists into contact with places and people who are largely invisible in many biomedical laboratories. In the behavior genetics laboratory, animal housing is a space that is controlled and defined by multiple actors and discourses: The scientists themselves are concerned with the management of this space because they see it as an important part of their experimental system, but building managers, vets, animal care staff and the Institutional Animal Care and Use Committee are also responsible for the management of animals when they are not actively engaged in experiments. The interactions around animals and their housing shows multiple overlapping understandings of the animal - as a breeder, a disease vector, an "ethical" subject, a being that can be stressed, an experimental object to be controlled - as well as different strategies for realizing these

understandings.

Transposing Bodies of Knowledge and Techniques: Animal Models at Work in Biomedical Knowledge Production. *Adele E. Clarke, University of California, San Francisco*

A prominent feature of biological and biomedical research and therapeutics over the past century is the entanglement of human and other animal bodies in the making and remaking of knowledge, technique and products. In this paper, we explore how animal models work in actual practice through two different but interrelated contexts: the early/mid-twentieth century reproductive sciences and early twenty-first century cloning of endangered species. We conceptualize these animal modeling practices as transpositions, a process that refers to both assertions of generalizability of findings across species and to the processes whereby the bodies of knowledge and technique that come with certain infrastructural arrangements are moved to another area of interest. Situating transposition as a social process in the domain Sarah Franklin calls transbiology, we track different kinds of mixtures created in the modeling practices of the reproductive sciences across the twentieth and into the twenty-first centuries along with the recalcitrant processes that result. Specifically, we contribute to understanding how animal models work in actual practice---in the situated production of biomedical knowledge and technologies--- at two different sociohistorical moments of American reproductive science. The exemplar of early/mid twentieth century animal modeling took place when a priori assumptions regarding species similarities and the legitimacy of transpositions generality had recently taken hold in routine scientific practices. In contrast, the contemporary animal modeling example in the context of reproductive technology development in zoos demonstrates quite lively tensions regarding assumptions about diversity and generality. The paper thus documents the re-opening of the black box of transposability in the reproductive and regenerative sciences, a pattern also recently manifest in the neurosciences, psychology and elsewhere. Species difference "matters" again---or more accurately, it is again foregrounded. We contend that transposition practices are sites through which different species bodies are dynamically "co-produced" through the elaboration of theories, techniques, bodies, and infrastructures capable of cutting across species bodies. We conclude that transposing bodies of knowledge and technique produces distinctive social relations among involved groups, new products for circulation, and new infrastructures for future research. The paper draws upon two multi-sited ethnographic projects both of which utilized grounded theory analysis. It contributes to STS through discussion of changing patterns of animal modeling, analyses of organizational and methodological innovation in science, and the elaboration of research infrastructure in biological, biomedical and zoo-based projects.

Supersizing Science; the case of systems biology. *Niki Vermeulen, University of Vienna*

In recent years there has been a clear rise in scientific collaboration, as well as in studies on the subject (Katz and Martin 1997; Hackett 2005; Shrum et. al. 2007). While most scholars examine disciplines traditionally known to be collaborative, such as physics and space research, my research focuses on biology (Vermeulen, 2009, Parker et. al., forthcoming). It investigates the growing collaboration in the life sciences, or the emergence of what is called 'big biology'. Collaborations in biology are characterized by a networked structure, which evolves in interaction with the integration of information and communication technologies. Within biology different styles of collaboration can be distinguished, varying from natural history collaboration, to laboratory collaboration and academic-industrial collaboration. While natural history collaboration already has a long history, collaboration in laboratory biology has increased substantially with the Human Genome Project. These molecular biology collaborations are analysing the various elements of biological entities and processes and also increasingly study their interaction. Finally, collaboration with industry is geared towards innovation and proliferates, both in practice and in literature (Gibbons et. al., 1996; Thackray, 1998; Waldby & Mitchell, 2006). These different styles of collaboration also present different deliverables, respectively data, information and products. In this paper I will concentrate on collaboration in systems biology. As a multi-disciplinary research approach, systems biology brings together scientists from a diverse range of disciplines -varying from microbiology to biochemical engineering, physics, computer science and mathematics- to work on the modelling of different processes of life, from specific processes in a cell to the modelling of complete cells or micro-organisms. The ultimate aim of scientists involved is to build models of complex entities of life, like plants, organs, or even a complete human model. These digital models are envisioned to mimic all the processes of a living organism and to replace it in scientific experiments, making research faster, less complicated and more reliable. It is assumed that systems biology will influence all fields where live organisms or processes can play a role, varying from health, agriculture and food to industrial processes, energy and the environment (Remacle & Benediktsson, 2006). Moreover, systems biology presented as a scientific enterprise that will deliver profits (Mack, 2004). Based on interviews with scientists and policymakers as well as observation of meetings on systems biology, I will analyse the emergence of this new scientific field and explore what kinds of scientific collaboration are produced in the context of systems biology.

136. Communication devices and Users I

10:45 to 12:15 pm

5: 512

Participants:

Learning through Standards : re-evaluating role of the 'Chinese' 3G standard in shaping the global telecommunications industry. *James Stewart, Institute for the Study of Science, Technology and Innovation; University of Edinburgh*

This empirical paper discusses the use of standards making by the Chinese government as part of policy to develop an 'independent' 3G mobile system for China - "TD". In the early 2000s, when China as joining the WTO, this was regarded as a protectionist move - 'technonationalism' (Suttmeier et al 2002) against the formal opening of markets. The subsequent development and deployment of 3G services in China and around the world illustrates a rather different path in practice to that anticipated, a path that reveals a struggle by the Chinese government, systems vendors and operators to align interests in various markets and policy domains. . First the development of the technology to implement the standard took many years, such that competing systems were already quite mature when 'TD' was available to be implemented; Second, it was not a China-only set of technologies, but a shifting of competition between major global technology players into the Chinese market. Third, the Chinese government has continued to favour stimulating competition between multiple technologies, or in this case formally standardised systems; and fourth, the success of Chinese telecoms system vendors on the global market appears to have happened despite the policy, and not because of it. The paper shows how initial objectives of reducing the cost of foreign patent fees for Chinese manufacturers and operators, and of stimulating indigenous technological capability were not sufficient to align the necessary support and investment until they were modified by objectives of national security. Two new objectives have emerged: 1.Current support for investment in the 'Chinese' flavour of next generation unified 4G system, a global standard LTE Advanced, signals a desire to maintain it as a Flagship of Chinese technological capability, and 2. 'TD' is now conceived of as an export technology, particularly in the context of growing markets in the developing world. For Chinese firms, a global presence has also involved learning how to participate in global standards processes - where competition not only occurs in the marketplace for systems, but also in the committees and legal battles of Standards Consortia. This case will highlight the importance of understanding the transformation of objectives, the

role of implementation policy in standards, and raises questions about the role of standards processes in future global technological innovation projects.

The first transatlantic computer communication between East and West. *Frank Dittmann, Deutsches Museum, Munich*

In July 1977 an experimental computer communication network between four countries had been organized. During three weeks scientists of Austria, Poland, USSR, and USA could communicate electronically across the Iron Curtain. Today this fact leads to several questions, e.g.: Who are the protagonists behind this experiment? Whey and how it happed during the Cold War? Which technology had been involved? A key role played the International Institute for Applied Systems Analysis near Vienna. IIASA was founded 1972 as an international institution where teams with scientists from different countries could work together on vital problems of the mankind in spite of their political and ideological differences. The man behind the experiment was Gennadij Dobrov, a Soviet scientist. He tried to support the idea of international teams building by recent technology. A computer network should help to avoid a lot of administrative problems which appeared in the case of traveling scientists through the Iron Curtain. The paper deals with the 1977 experimental computer communication network. A very interesting fact is that most of the pioneers in computer network technology from East and West joined on several IIASA conferences and had therefore the opportunity to discuss appropriate concepts and ideas. The paper argues that the idea of wide spread computer networks did not be primary a utopia of enthusiast in computer science or the result of excessively using of high performance computers. This concept seams to be a result of an international discussion between scientists from East and West about knowledge management.

Monstrous Models or Virtual Buildings? The non-standardization of communication technologies in architectural work. *Ursula Plesner, Copenhagen Business School*; *Maja Horst, Copenhagen Business School*

Today's architectural practices are being transformed by a series of recent technological developments. Advanced digital modeling allows for collaboration and integration of a mass of details from the earliest phases of a given project. Also, architects can now invite partners into still somewhat crude virtual environments and can integrate a wide variety of technical information and design experience in such spaces. But political demands for digital buildings that incorporate layers of information (that may otherwise be lost in paper binders) and the promise of experience and immersion linked to virtual worlds technologies are not necessarily pointing in the same direction. Those developments are partially linked in monstrous models, and partially disconnected because there exist too many standards and formats, attached to different actors' projects. This paper develops work in the STS tradition on architectural practices (Callon 1996, 1997, Yaneva 2005, 2009) and operates within the general framework of technical innovation studies (Bijker 1995, Latour 1991). It looks specifically at how architects' communication technologies and markets and users mutually configure one another (Callon 2007). We try to capture communication technology innovations in the making, at a moment where innovation processes have yet to converge, and before there are any black-boxes to open. 'The virtual building' may seem to be an especially elusive object, but we must understand that architecture was always virtual, and virtual all the way through. Virtuality, meanwhile, is enacted differently in the different communication practices through which it circulates and is translated, more often than simply standardized. We present three case studies of how architects engage with different digital formats to communicate design visions. Analyses of advanced digital drawing programs, game technology and virtual worlds show how the innovation and use of technologies are inscribed in complex networks of skill, economy, aesthetics judgment, standards, professional ad hoc partnerships, and political demands. The use of advanced digital drawings, for example, is dependent on the price of hardware and software and the availability of standard programs. Because work processes in architecture are ad hoc, it sometimes becomes too expensive to develop technology in relation to particular tasks, so architects make do with a combination of software technologies adapted from other realms. We also show how design experiments with architecture in virtual worlds disconnect and reconnect with real life architecture, and how game technology allows actors to engage in the discussion of architectural visions. These types of communication technologies establish a public of politicians, city planners, citizens, and cultural heritage professionals, where the willingness of some of these actors to pay for the technology influences the creation of special applications.

Institutional Conflicts in the Web 2.0 Era and the Evolution of Consumer Activism: Korean Candlelight Protests 2008. *Yenn Lee, Department of Health and Social Care, Royal Holloway, University of London*

On 2nd May 2008, a wave of candlelight demonstrations broke out in South Korea, which lasted more than 100 days. Starting as a protest against the American beef imports deal agreed to in April, the demonstrations represented criticism directed at the newly elected conservative government, for having hastened the deal in order to please Washington despite the declining credibility of US food regulation. As the wave of protests developed, the target expanded to include the conservative media troika Chosun Ilbo, JoongAng Ilbo and Dong-A Ilbo (more commonly referred to by an acronym Chojoongdong), which were vigorously supportive of the government's actions. Protesters were angered by the fact that these national dailies had earlier warned their readerships of the dangers of mad cow disease from American beef and attacked the previous liberal government when it considered lifting the ban. Anti-Chojoongdong movements had been around before this incident, but what has to be noted here is the change in modus operandi. Media reform activists in earlier days concentrated on raising public awareness on the country's distorted media environment and the nexus between these media houses and right-wing politicians and business conglomerates. The attempt had not, however, led to a concrete outcome principally because the activists could not match up to Chojoongdong's resources and circulation. The so-called Web 2.0 Generation took a different approach on this occasion. A list of companies that placed adverts in the three dailies was collectively maintained on a bulletin board. Individual members then would phone these companies, whenever it was convenient for each of them, and warn that they would boycott their products unless the adverts were withdrawn. As more and more companies began to withdraw their adverts, the media troika pressurised lawmakers and law enforcement, as a result of which most of the postings on the bulletin board were permanently deleted by the Korea Communications Commission (KCC), and foreign travel bans were imposed on 20 members holding the administrative responsibilities of the community. As their bulletin board could no longer serve them, members created a publicly accessible Google document instead so as to try and circumvent restrictions in the Korean cyberspace. Eventually, given the legal hassles the community had been winding up in, it decided to register officially as a civic organisation. By examining the ways in which an event engendered an informal consumer network, which in turn developed into a formal civic organisation, the present article aims to set this unique event in context and discuss its political implications to Korean society and, as Bello (in Eom, 2008) also points out, to other Asian states. The recent series of protests against American beef imports in Taiwan at the beginning of this year, eventually resulting in the overturn of the deal, is perhaps an indication. The article also pays attention to institutional conflicts observed in the Korean case and how a movement against globalising forces appropriated a global service in order to circumvent domestic laws - a phenomenon that gave birth to a term "cyber-exile".

137. Energy consumption: what are the missing links between

the users and the sociotechnical regimes?

10:45 to 12:15 pm

5: 513

This session is devoted to the exploration of approaches that take seriously into account the role of users and practices in the shaping of household energy consumption and production. There is indeed a gap between the theories of technology diffusion and the appropriation of these technologies by users. On the one hand it seems to occur a universal movement of proliferation of technological objects, and on the other hand innumerable studies have shown that these objects are always appropriated, heterogeneously interpreted and re-created in the everyday life's various situations. This gap can lead to the disregard and negligence of users, as illustrated in the case of individual photovoltaic installations. The global contexts involved in this session's proposal thus embrace the whole set of objects related to energy consumption, and their networks, physical as well as social. Such context(s) is(are) also inseparable from the issues raised by the unsustainability of our ways of spending energy and the growing necessity of energy transitions. In contrast to "the" globalized context and to the seemingly universal (and thus inescapable) processes of technology, the session looks at the diversity of practices and cultures and the many emergent forms of "empowerments" that result. This session contributes to the theoretical development of STS in bringing elements that appears as necessary for integrating uses and users in this research field. The involved papers will draw insights from innovation theories, material culture studies and ethnographies of practice.

Participants:

Scope, scale and processes of socio-technical change: conceptualising dynamic regimes of energy demand. *Elizabeth Shove, Lancaster University*

In this paper I elaborate on the 'spatial' aspects of sociotechnical change. The intellectual heritage of innovation studies brings with it a tendency to track the diffusion of specific technologies either within national borders or more commonly without explicit reference to issues of cultural or geographical range (Geels 2005). Meanwhile, detailed analyses of situated learning emphasise the localised appropriation of new and existing tools and devices (Lave and Wenger 1991). Although both traditions are relevant, neither is particularly well suited to the task of understanding and analyzing trends like the global diffusion of air conditioning, its capacity to 'colonise' many different cultures, or its ability to penetrate and transform diverse complexes or regimes of social practice. In focusing on this topic I address the conference theme of 'STS in global contexts'. As I explain, new ideas are required to make sense of a) how sociotechnical regimes extend in scope and scale, b) how technologies that circulate widely generate dispersed communities of practice, broadly defined and c) how the varied 'geographies' of the different elements that constitute a sociotechnical regime come together, and how they move apart over time. In exploring these questions I contribute to an understanding of how the co-evolution of complex sociotechnical systems proceeds, and to an appreciation of the multiple geographies of which sociotechnical regimes are woven. I do so with reference to the recent history of the indoor climate, and to cooling and air-conditioning in particular. The spread of mechanical cooling around the world is associated with rapidly escalating energy demand and with the proliferation of increasingly standardised but ultimately unsustainable ways of life. Air-conditioning technologies are introduced and appropriated within very different traditions and cultures. On a global scale, their 'arrival' has changed the 'geometry' not of one pre-existing regime but of diverse indoor climates and related ways of life in the USA, Australia and Japan. In each of these settings, air-conditioning fits into sociotechnical regimes also defined by 'technologies' of building design and clothing, and by ideas of comfort, nature and physical well being, all of which have related but not identical trajectories with respect to the details of their social and cultural specificity (or diffusion). In attending to these relations I show how different areas of STS - specifically innovation studies and ethnographies of practice - might be combined. GEELS, F. W. (2005). Technological transitions and system innovations : a co-evolutionary and socio-technical analysis. Cheltenham, UK ; Northampton, Mass., Edward Elgar Pub. LAVE, J. and WENGER, E. (1991). Situated Learning: legitimate peripheral participation. Cambridge, Cambridge University Press.

Objects of energy consumption: where STS cross practice theories. *Greg Wallenborn, Université Libre de Bruxelles*

This paper comes at the end of a research about the role of objects in household energy consumption. It has allowed the exploration of the uses of the highest technological objects involved in everyday practices (e.g. electronics, screens, complex networks). From a STS perspective, energy consumption is distributed between objects and people. However the distribution of responsibility for consuming energy between the user and the object differs according to the kind of object and to its users. The action can be more or less delegated to the machines or to the users, for instance in scripting some practices into the objects (Latour, 1993; Shove et al., 2008). In theories of sociotechnical innovation, users have an unclear role. These theories are wholly relevant to follow the development and the circulation of new objects. They have however proved a smaller success when a multiplicity of users, with a high diversity of practices, is involved. The object under scrutiny is generally a categorial object, exemplar of a typical situation. Another approach is therefore needed that could embrace both the diversity of practices and the question of energy consumption. A practice can be defined as what satisfies a set of constraints (Stengers, 2010). And each energy-related object embodies a series of constraints pertaining to different categories of requirements: technology, economy, ergonomics, social and cultural aspects, health and safety, ecology, ethics The term 'constraint' should not be considered as a limitation, but rather as what obliges to create new relations under specific requirements. Constraints are mutually negotiated for eventually constituting an appliance. From the practitioner's point of view, constraints can be split up into requirements and obligations. Requirements are constraints imposed by the practice itself, while obligations are constraints made compulsory for external reasons. For instance, energy is required by the practice, but there is an obligation to reduce energy consumption. Obligations and requirements change according to the scene on which the object plays: a technical standard can be both a requirement from legal authorities and an obligation for manufacturers. Today it is not clear how the environmental constraint could play in practices involving objects of energy consumption. In a practice, an object comes under the guise of requirements (its good performance) and of obligations (functioning of networks). Drawing from the 'materiality turn' in STS, inheriting from material culture studies, the paper describes the way some objects entering in households can redistribute requirements and obligations, how design has up to now mainly contributed to mask the obligations (e.g. invisibility of energy consumption), and how standards make evolving the border between requirements and obligations. LATOUR, B. (1992), « Where are the missing masses. The Sociology of a Few Mundane Artifacts," in BIJKER, W. E. and LAW, J. (Eds)., Shaping Technology/Building Society, Cambridge, MA, MIT Press, pp. 225-258. SHOVE, E., WATSON M., Hand M. & INGRAM J. (2007), The Design of Everyday Life, Oxford, Berg. STENGERS I. (2010), Cosmopolitics I, University of Minnesota Press.

To Empower individuals to fight against climate change: the multi-scope issues raised by the dyad 'photovoltaic systems + smart grids'. *Ariane DEBOURDEAU, Centre de sociologie de l'innovation - Mines ParisTech*

Individual photovoltaic (PV) installations are inseparable from the evolutions of the electric grid toward the so-called "smart-grids", i.e. a global system meant to bear and support the introduction of variable and decentralized energy supply. Nevertheless, this dyad composed of PV and smart grids is hardly thought in a single movement. Actually individuals and consumers tend to disappear from the concrete conceptions of the coming smart grid's, by restraining the consumers' potential

commitments to their price-sensibility. In the same time, some socio-technical devices are conceived and set up in order to "empower" the consumers as actors - in the whole sense of the term - of the electric supply. For instance, PV systems' owners are more and more equipped with software which help them to manage their PV installation, and for example to know the amount of CO2 avoided-emissions and so on. In some countries, like the USA, some incentives now depend on the productivity of the installation during peak-periods (e.g. for air conditioning at midday), engaging people to produce at specific time periods - no matter if consequently the total amount of energy production will be reduced. Thus one of the main constraints remains the injection on the grids of the electricity produced by decentralized installations like PV systems in its integrality. Indeed, people cannot decide to consume their own electricity at some time-periods, and consequently cannot fully enact the engagement toward issues, like climate change and energy transition, that are associated with the renewable energy installations. At a more global scale, these types of devices are thought to contribute to a wide socio-technical change which focuses on the necessary growing responsibility toward energetic matters. The gap or the shift between the consumer-oriented devices and the essentially technical orientations of the smart grids illustrate the difficulties in integrating consumer local practices - or the potential ones - into the global context of energy transition and the major changes it implies, particularly in the public policies and in the markets' regulations (Callon, 2009) - at the multiple scales on which they intervene. Our purpose here is thus to use the classical STS view on a socio-technical system (Akrich, 1992) to describe the various entanglements of two of its features - i. e. solar PV systems and smart-grids, that are radically attached to each other but also partly separately configured. Through a multi-scales and multi-sites exploration of these dyadic modes of existence we will highlight the proliferation of the global contexts (Sassen, 2007) - even potential or virtual - and the related paths that impede from embracing issues like climate change and energy transition. AKRICH, M. (1992). "The de-scription of technical objects", In: BIJKER W.E., LAW J. (Eds.), Shaping Technology/Building Society. Studies in Sociotechnical Change. Cambridge, MA: MIT Press, pp. 205-224. CALLON, M. (2009). "Civilizing markets: Carbon trading between in vitro and in vivo experiments", Accounting, Organizations and Society, 34(3-4): 535-548. SASSEN, S. (2009). A Sociology of Globalization, W. W. Norton & Company.

Chair:

Elizabeth Shove, Lancaster University

Discussant:

Noortje Marres, Said Business School, University of Oxford

138. Social Networking and Their Sites

10:45 to 12:15 pm
5: 514

Participants:

CORE NETWORKS OR BOUNDED SOLIDARITY? Mobile Phones changing Social Networks in a Developing Region. *Antony Palackal Varghese, Loyola College of Social Sciences*; *Wesley Shrum, Louisiana State University*

Mobile telephony has diffused more rapidly than any Indian technology in recent memory, yet systematic studies of its impact are rare, focusing on technological rather than social change. While the Internet monopolized scholarly attention during the 1990s, the rapid diffusion of mobile phones in the early 2000s instigated a parallel shift in scholarly work on new information and communication technologies. Yet understanding of these new media has been hampered by the absence of the longitudinal studies that are required to document change in behavior. Jonathan Donner's (2008) comprehensive review of over 200 recent studies of mobile telephony in the developing world reveals no survey of the social impacts of mobile phones conducted over more than one time period. In short, while there is much speculation and many case studies of cellular telephony, systematic scholarly studies of social change are few, if any. In the absence of longitudinal data, it is difficult to proffer evidence-based claims regarding social change. We focus on the southwestern Indian state of Kerala between 2002 and 2007, arguably the main period for the exponential diffusion of mobiles throughout India. Our study was designed to measure changes in technology use and its association with social network patterns. In particular, we focus on core networks—relatively strong, ego-centered relationships—their size, type, and geographical dispersion (the location of the tie). We also present data on usage patterns among both professionals and non-professionals: the former group representing a relatively homogenous sample from the two selected years. The most striking finding is the decline in the number of core social connections together with a shift towards family and friends and away from work relations. We interpret this finding as support for the bounded solidarity thesis of mobile social ties. The central question of this paper is whether the widespread adoption of mobile phones affects the structure of core networks, defined in terms of the size and distribution of alters in different social categories and locations. We hypothesize that social networks should decrease in size, center more on friends and family, and become more local in orientation. Longitudinal data is required to demonstrate network effects. We argue that the potential for major social structural change with new ICTs is related to their potential for the establishment and maintenance of social ties. This will have consequences for the characteristics of the social networks that result. Our empirical contribution is to an emerging scholarly discourse that seeks evidence of changes in social relationships—specifically, in core networks—in locations where technology reduces dependence on co-location.

Social Affordance of ICTs on Interpersonal Networks and Social Capital. *Meng-Hao Li, University of Illinois at Chicago*; *Dr. Shu-fen Tseng, Yuan Ze University*

The roles of information communication technologies (ICTs) as mediums that affect interpersonal networks and social capital have heatedly debated in recent years. There were three hypotheses: the ICTs can either extend, complement, or reduce interpersonal networks and social capital (Koku & Wellman, 2002). In this paper, however, we argue that all of these hypotheses had assumed the impacts of ICTs were homogenous and ICTs were regarded as one dimension medium. They failed to examine the diversities of ICTs and their multi-functions as social mediums. By employing social affordances approach, this paper adopts the argument that each ICT has its peculiar functions and constraints as well to allow individuals use this particular kind of ICT to pursue their diverse social needs (Wellman, 2004). The functions of ICTs are determined by how individuals recognize potential opportunities and limitations of the ICTs. Moreover, two types of social affordances in ICTs are suggested: media multiplexity and division of media. The media multiplexity model states individuals who communicate frequently are more likely to use multiple ICTs to do so (Haythornthwaite & Wellman, 1998; Boas et al., 2006). The division of media model shows individuals use ICTs based on their given purposes. Both models indicate that a reexamination of the impacts of ICTs on social capital from the social affordances approach is needed. This article aims at (1) comparing three different ICT interpersonal networks (mobile phone, instant messengers, and email) in terms of their differences in network size, strong ties, interpersonal diversity and contact frequency, and (2) analyzing how do different types of technological interpersonal networks relate to quality of life and social participation. This research was conducted by a face-to-face social network survey during April to May in the year 2009, and respondents were selected by stratified sampling and within-household sampling in Kinman County, Taiwan. There were a total of 29,315 households in Kiman County. This study successful interviewed 368 household respondents under a 5% margin of error at 95% confidence interval. Name generator measurement were used in the social network questionnaire, and each respondents were asked to answer three types of

interpersonal networks (mobile phone, instant messengers, and email) respectively. The result indicated that both media mutliplexity and division of media were verified in this study. About 30% alters coexisted within three technological interpersonal networks that means individuals who had diverse types of relationships were more likely to communicate with alters with multiple ICTs. Moreover, in comparison of three networks, mobile phone networks revealed a larger network size, higher proportion of strong tie and more contacts with others in comparing with instant messenger and email networks. Individuals preferred to use mobile phone to communicate with local, strong tie interpersonal network instead of other ICTs. In contrary, emails were used for a longer distance, less acquaintance, and less contact relationship. Secondly, in all, more use of ICTs did increase some extents of quality of life, however, the more use of instant messengers indicate a negative impact on social and public participation.

From Scripts to Cultural Waves. *Basile Zimmermann, University of Geneva*

The aim of this paper is to build links between actor-network theory, grounded theory, and cultural anthropology frameworks. It will discuss their respective methodological and theoretical approaches and question how they can be used to deal with issues related to the general question of "cultural difference". Based on eight years of regular field research in the People's Republic of China, the presentation will include observations on: - How Chinese electronic musicians in Beijing work with devices and software that have been designed in Japan and the USA; - How Chinese-speaking users of computers deal with alphabet-encoded technologies to write Chinese characters; - How social networking sites in China rely on international standards in matters of web design before creating their own tools in order to attract Chinese net surfers. Insights, such as the concept of "collective action" by the sociologist Howard Becker; the grounded theory methodological tools by sociologists Juliet Corbin and Anselm Strauss; anthropologist Philippe Descola's theoretical framework on the different ways of ascribing qualities to beings in the world; and finally STS classics from Madeleine Akrich, Michel Callon and Bruno Latour will be discussed in parallel. The main idea of the paper is to show how Akrich's notion of "script", Latour's works on nonhumans, Becker, Corbin and Strauss' emphasis on description, as well as anthropologist Philippe Descola's theoretical framework can be linked together in order to suggest a new conceptualisation for "culture" that matches, for example, Indian-American anthropologist Arjun Apparudai's framework of cultural flows.

Self-exposition on Social Networks Sites - Findings from an online sociological game. *Dominique Cardon, Orange Labs*

What are the different ways people expose themselves on major Social Networks Sites (SNS)? Are there sociological determinations among their level of exhibition? How do different forms of self-exhibition lead to specific relational behaviors on the Internet? The purpose of this study is to give an empirical glance on different forms of self-exposure on Social Network Sites in France. Based on a sociological on-line game (sociogeek.com), it explores the different tendencies in the self-exhibition shift and tries to find out how it is linked to different strategies in order to choose friends. In the first game, people have to select, among four ranked pictures, the one they would accept to publish on their personal webpage. In the second game, they had to choose friends by discovering, step by step, five informational attributes to their internet profile. Analysis of a sample of 12,354 French respondents shows a middle-range level of exhibition and isolates five different ways to expose oneself: Modest, Traditional Exhibition, Bodily Immodesty, Show-off and Provocative. Those different self-exhibition patterns lead to specific relational behaviors on the Internet. The study underlines socio-demographic differences (age, gender, diploma, and occupation) in self-disclosure practices and shows that exhibition on the Internet must be considered as a strategic performance. One of the underlying results of this survey is the idea that with SNS, users can develop different strategies of self-exhibition, and that those strategies are strongly related to some socio-demographic variables. Accordingly, those strategies are also correlated to different ways of selecting friends on SNS, and to value different identity attributes. This study brings insights on the effect of online social networking in the building of social relations. In this presentation, we will also explore the different methodological considerations about the internationalization of this survey in order to compare self-exposition countries in various countries and different cultural contexts.

Applying and expanding situated learning theory: a Web 2.0 system development case. *Rieko Sawyer, Tokyo City University*

In this research, we first clarified how Web 2.0 systems as social architectures are arranged and utilized based on ethnographic study and on surveying the internet focusing on the activities of a community of web system engineers. In doing so, we shed light on how the environment for Web 2.0 system development is organized. Second, we conducted a field survey on a research project for developing Web 2.0 systems. Based on this survey we analyzed how the learning environment of Web 2.0 system development for students is organized. Finally we proposed perspectives for designing the learning environment of modern web technologies. This research is based on the project "The design of communication platforms in Newtown utilizing ICT: Gathering local information, and promoting and supporting local activities via web2.0 technologies". The purpose of this project is, first of all, to collaborate with citizen's groups in local areas to design communication platforms such as SNS (Social Network Services) and electronic map systems on the web for broad information distribution exchange among people concerning the activities of city design. In this project, students play the major roles collaborating with local citizen's groups to develop web systems and conduct various types of fieldwork in the local area. Second, by using the above web systems, local citizens and the university collaboratively work on solving problems in city design. Through participation in the project, students obtain many opportunities to learn how to develop and utilize ICT (Information and Communication Technologies). In other words, the this project attempts to enhance the ICT learning environment for students through this collaborative practice of the local city. In this project, students and project members developed the following web systems: Timeline Map: a system which enables one to post photographs and texts to GoogleMaps from GPS-enabled cell phones. It includes additionally a chronological table-like time line on the map, displaying time information for each item as well as its location information. When a photograph or text is sent, the time of each item will appear on the timeline and the location of each item will appear on the map. When an item on the timeline is clicked, the location of the item will be shown on the map. Conversely, when an item on the map is clicked, the timeline moves automatically to that time point, and the time information of the item appears on the timeline. Talkline: a system which combines a micro-blog and a social bookmark function. One can bookmark a site and exchange comments about the site on the micro-blog. It can be used as a local social bookmark system for local citizens' groups. The fieldwork covers not only the web system development but also the ways of using these web systems in the activities of community building. In doing so, we attempt to show web system development as social media is to design the new formation of people' s activities and linkages including social media.

139. Reflection and Frameworks

10:45 to 12:15 pm

5: 515

Participants:

Postmodern Management. *soo-il kwak, The National Academy of Sciences, Republic of Korea*

Paper Abstract; Author: Kwak, Soo-Il (郭秀一) Session: Information and Communication Technology (ICT) Title of presentation paper: Postmodern Management Keyword: Impact of ICT on management and business enterprises One of the greatest changes in the last 30 years is the development of information and communication technology (ICT), which transforms almost all of most business enterprises in their management. The theories and knowledge of modern management have been developed during the last century, dating back from early 1900's when Fredrick Taylor published his book, 'Principles of Scientific Management" to Peter Drucker's "Management" During the period, theories of modern management have increased effectiveness and efficiency greatly in the areas of production, marketing, finance, personnel and accounting.. But the applications and uses of ICT in business enterprises are bring the 'end of modern management' and the 'future of management' tends to emerge in the form of new theories and practices, such as 1.'Organizing without organization' :Through the use of ICT, people can be organized for certain objectives without formal organizations and can overcome the shortfalls of rigid organizational problems. The more people are involved, the more it is effective and efficient to organize those without formal organization by using ICT. 2. 'Manufacturing without factory': Contrast to the old concept that manufacturing has to be done on site, the Global Business Networking makes it possible to make any products without own factory. Many of the popular products, such as iPhone, are designed by A company and parts are produced by different companies and assembled by another companies. Thus, the new concept developed by Kevin Kelly, that "if you can touch it, it is not real" is becoming a reality in the networked economy.. 3.'Vendor-managed inventory': By letting vendors manage inventory in store, a mass retailing company of 1 billion dollars sale a day plan to eliminate their own inventory down to zero. Eventually the retail giant will only own store buildings and shelves inside their stores and all the stocks inside shop will be owned and managed by vendors.via information and communication technology. 4."Customer Relationship Management' enable companies to market their products and services on one-to-one basis in mass marketing all around the world. Unlike the past marketing practices, companies attempt to know their customers on individual basis, such as who they are precisely, what each customer is buying and what their behavioral patterns are, etc. 5.'UCC (User-created contents)' will be a commonplace in future management in the form of 'user-created product', 'user-created design', 'user-created advertising', etc. 6.'Collaboration with outside experts in R&D' will enable many companies to utilize outside experts and know-how in research activities. The book 'Wikinomics" clearly shows the new phenomena and advantages of research using WIKI program. 7.'Long-tail' story tells us the changing aspects of market and marketing strategy. Thus, Postmodern management will be centered around the application of rapidly developing information and communication technology and will emerge as new theories and practices in future..

Reflections on the Second Wave of STS. *Sang-yong Song, Hallym University*

Reflections on the Second Wave of STS SONG Sang-yong Hallym University ABSTRACT STS emerged as an established field in the 1970s with the help of the sociology of scientific knowledge in Europe and America. But it is not very well known that there were predecessors back in the early twentieth century. Science of science was the title of the article by Ossowski and Ossowska in the Organon in 1936. J. D. Bernal's The Social Function of Science (1939) was the first full-fledged scientific analysis of science based on Marxism. After World War II, science still seemed to be a guarantee for progress in spite of the tragedy of Hiroshima and Nagasaki. However, the image of science became aggravated suddenly in the 1960s due to the environmental deterioration. Science was the target of the counter-culture movement' which swept over industrialised countries. The attack on science came from within as well as from outside the scientific community. The criticism of science was not confined to intellectuals, but pervaded widely among the general public. Anti-science movement aimed at not only high technology, but also science itself. The challenge to the goal and result of science policy came to doubting the inherent norm of science and its epistemological status. With the collapse of socialism in the 1980s, the zeal for radical science became hardly visible. The turn of the century witnessed the amazing development of biotechnology and nanotechnology, which brought forth the interest in the ethics of science and technology. Accelrated climate change reminds us of a crisis far more urgent than 1960s. Nevertheless, the critique of science and technology draws little attention in the STS community. Now is the high time to begin the discussion about where science should go.

Science and Technology, Agents Who Cannot be Held Responsible. (Risks of Loose Definitions and Personifications). *Amir H. Ghaseminejad, Simon Farser University - Capilano University*

Scholars in Science and Technology Studies have found that there are reciprocal influences between sciences and technologies, and political, economic and cultural fields. However, some scholars do not clearly demarcate between different sciences, technologies, and related artifacts. While investigating the extent of being influenced by and influencing the society, some researchers tend to use loosely defined words, when referring to these broad fields of knowledge and practitioners in these fields. As a result, the differences between domains of science and technology are sometimes neglected and sweeping generalizations are made. This paper argues that "pure basic science", "use inspired basic science" or applied science, technology, technique, engineering, products and artefacts are different than each other and distinct from scientists, engineers and technicians. Each of them is influencing the society differently and each is affected by society to a certain degree. The paper establishes that sciences and technologies, as well as political, economical and cultural influences situated in a historical context are the determinants of the social outcomes. Considering agency for non human actors is plausible in the sense that they are determinant variables of the trajectory and outcomes. However, when they are personified, it is sometimes neglected that non-human agents cannot be held morally responsible. As a result, statements are made that do not clearly identify who should be held accountable for specific outcomes. The paper uses interpretive rhetorical criticism method. It gives examples of the practice of personifications which are sometimes observed in science and technology studies. One genre is recognized when we identify the risks that are determined by development of some fields of science and technology. The other is seen when we criticise the harm to humanity caused by using science and technology in certain ways. The paper argues that since artifacts and constructs such as science and technology cannot be held accountable, statements that position them as the subject of an effect may distract the attentions from those who can be held accountable for the outcomes. For all the evitable outcomes, the only ones that can be held accountable are people. Our decisions are the only independent variable that we may be able to change. The social researchers, natural scientists, philosophers, artists, power elite and citizens are the only ones that can be held responsible. The paper concludes that although referring to different constructs as one may simplify the research hypothesis, we should refrain from referencing techno-science domains as if they are one field to prevent construct validity problems. Also, we have to avoid statements that may be confusing the agency of artifacts in its social scientific sense, with their accountability in moral sense. The practice of referring to science and technology as agents may be useful because it reminds us to include them in the network of the actors, but personification is a slippery road which may also lead to forgetting that any moral criticism of non-humans is not fruitful.

140. Socio-Technical Integration Research (STIR) I and II

10:45 to 12:15 pm
5: 521

This joint session introduces a novel mode of STS inquiry and engagement that is being carried out in an international set of policy contexts: the laboratory engagement study. Under themes of "responsible innovation," science policies around the world have mandated attending to the societal dimensions of science and engineering activities in ways that have the potential to influence these very activities. What roles might STS scholars and insights have for enhancing scientific research practices? We bring together the work of junior scholars who are collectively embedded in over 20 laboratories in ten countries across three continents in connection with the STIR project, run out of the Center for Nanotechnology in Society at Arizona State University. Using an intervention-oriented approach that reconceives and redirects the ethnographic study of the laboratory, STIR seeks to assess and compare the varying pressures on, and capacities for, laboratories to integrate broader societal considerations into their work. Embedded social and human scientists feed their observations and inquiries directly back into their laboratory research contexts in order to determine the capabilities of enhanced reflexive awareness among practitioners to modulate laboratory decisions, including material practices. The session papers are organized under two general headings: "Socio-Technical Integration Research (STIR) I: Responsible Innovation Practices" focuses on relations among policy aspirations, innovation practices, and science studies interventions. After a short review by Erik Fisher (Arizona State University, efisher1@asu.edu) of international policy mandates and questions raised for integration research, Michiel van Oudheusden (University of Antwerp, michiel.vanoudheusden@ua.ac.be) will discuss "Developing notions of responsible innovation in new and emerging technologies: the case of Flanders, Belgium," Byoungyoon Kim (Rensselaer Polytechnic Institute, byoonkim@gmail.com) will report on "Diversified 'Convergence': How Do Korean University Researchers Understand Convergence?," Paul Ellwood (Leeds University, bnpe@leeds.ac.uk) will present "Responsible Innovation as an Organisational Capability - an emerging aspiration" and Antonio Calleja-Lopez (University of Seville, acalleja@asu.edu) will analyze the STIR project in "STIR: Laboratory performances and Col-laboratory Inquiry." Discussant Professor Alan Irwin (Copenhagen Business School, ai.research@cbs.dk) and audience discussion will conclude Session I. Session II shifts the focus to "Socio-Technical Integration Research (STIR) II: The Laboratory Engagement Study," inquiring into the extent to which interactions with embedded social scientists may enhance critical and/or creative reflections by laboratory practitioners in light of broader contextual considerations, as well as the effects on the ethnographic self of this type of engaged scholarship. After a brief demonstration of the protocol for exploring "midstream modulation" by Erik Fisher (Arizona State University, efisher1@asu.edu), it turns to talks that describe their intensive laboratory engagements by Qin Zhu (Dalian University, China, zhu@mail.dlut.edu.cn) on "Responsible Innovation in Action: Contextualizing a Research Laboratory from within," Francois Thoreau (University of Liège, Belgium, francois.thoreau@gmail.com) on "Modulations of the laboratory: Institutions, interventions, and decisions in a Flemish industrial laboratory," Shannon Conley (Arizona State University, snconley@asu.edu) on "Biopolitics in a Canadian Genetics Laboratory," and Daan Schuurbiers (Utrecht University, schuurbiers@geo.uu.nl), on "Within and Beyond the Lab in The Netherlands and the United States." Discussant Rene von Schomborg (European Commission, Rene.VonSchomberg@ec.europa.eu) and audience discussion will conclude Session II.

Participants:

Developing notions of responsible innovation in new and emerging technologies: the case of Flanders, Belgium. *Michiel van Oudheusden, University of Antwerp*

This paper discerns different prescriptions for the responsible governance of new and emerging technologies that presently abound in the Flemish innovation context and identifies connections, ambiguities, and contradictions between them. Starting with a description of the structural and institutional innovation context in place, it finds that policy prescriptions for the governance of new and emerging technologies typically rest on an "innovation imperative"; i.e. a perceived need to revitalize local innovation capacity by strengthening the "knowledge commons" on which innovation depends. At the same time, and largely overlapping such calls for "strategic cooperation" and the practices they engender, national and supranational authorities increasingly demand public accountability from scientists and industries, urging them to innovate "responsibly" by taking into account "societal needs and concerns". As these prescriptions suggest an additional "broadening" of research considerations beyond scientific and commercial interests only, they pave the way for articulations of collective social responsibility that engage scientists as well as non-scientific publics. Thirdly, Technology Assessment (TA) initiatives, largely specific but not exclusive to the context of Flanders, have emerged that seek to instigate more "inclusive" and "deliberative" governance based on an "ethics of co-responsibility". Among these can be included integration studies such as the STIR project. The paper briefly outlines how these initiatives have evolved with, and in reaction to, Flemish innovation policy from the eighties onwards. It argues that TA carries the notion of responsibility a step further than established policy repertoires: from an appeal to abstract principles, such as "precaution" and "sustainability", and from codes of conduct and risk-benefits analyses, towards a role-principles dialogue on technoscientific responsibility. By way of illustration, it points out how the various readings above emerge and develop in a Flemish participatory TA project on nanotechnologies.

Diversified "Convergence": How Do Korean University Researchers Understand Convergence? *Byoungyoon Kim, Rensselaer Polytechnic Institute*

This paper investigates how "interdisciplinary research" or "convergence research" has been institutionalized and understood in South Korea through a case study of a university laboratory. It is often said that the word, convergence, has been popular in South Korea since Edward O. Wilson's Consilience was translated into Korean by his former student, Professor Jae Chun Choe, in 2005. However, it was not a novel idea. Interdisciplinary research had widely been discussed by many scholars including STS researchers for years before the publication of the translation and 'convergence' discourse was also popular in nanotechnology communities [due to Mihail Roco's reports and the phrase of socio-technical integration in the 21st Century Nanotechnology Research and Development Act.] Despite the popularity of the word, what impacts it has on technoscience is ambiguous. The idea of convergence seems to be constitutive of scientific research in contemporary South Korea. The Korean government initiated a national R&D program for convergence research and many laboratories in universities and research institutions begin to tag "convergence" as their identity. Many researchers are seeking convergence in their ways. While the term is widely used like this, there is no consensus on the English translation of it when they say it in English. A few examples are "convergent technology," "fusion technology," "convergence technology," "convergence of technology," and so on. This divergence implicitly reveals that the term and the phenomenon are understood differently by speakers. Furthermore, in terms of the scale of the concept in question, "convergence" in policy discourses is much bigger and more abstract than questions faced at everyday experiments. For instance, at the level of an individual researcher, the demand of convergence is associated with practical questions on the choice of research topics and collaborators. By juxtaposing influential policy documents from the US and Korea with empirical data from participation in a Korean university laboratory, I will demonstrate how discourses on "convergence" are traveled, modified, understood and put in practice. In tracing their evolution, the discussion on de facto and reflexive modulation (Fisher 2007) is used as a theoretical guide. In conclusion, I will show how policy discourses on convergence fail in capturing the richness of laboratory science, but simultaneously succeed in orienting scientists' rhetoric for legitimacy, instead of contending that convergence is just a fashion without a substance or is the future direction which researchers should follow.

Responsible Innovation as an Organisational Capability - an emerging aspiration. *Paul Ellwood, University of Leeds*

This paper will explore the micro-foundations of responsible innovation as an organizational-level capability (defined as collectively-held and action-oriented knowledge that enables organizations to get things done), and the mediating role placed by the strategizing-behavior of the research leader. Responsible innovation will be defined in light of science polices on three continents that call for various forms of socio-technical integration. The paper is based on interviews conducted with research leaders from laboratories that operate under the same science policies, each of whom has hosted an embedded social scientists in her or her lab.

Laboratory performances and Col-laboratory Inquiry. *Antonio Calleja-Lopez, University of Sevilla, Arizona State University*

In this presentation, I play with Andrew Pickering's proposal of a performative historiography of scientific practice, and present the Socio-Technical Integration Project (STIR) as an independent enaction (rather than interpretation) of that formula. I do it in two steps, first, by analyzing the key theoretical and programmatic intuitions of the project, which I compare with classic venues within STS, giving special attention to the tradition of laboratory studies. I show how STIR shifts the emphasis of the study from description to intervention, and from registering to stimulating practices within the lab. As part of this first step, I also scrutinize the notions of modulation and reflexivity at the level of lab practices, with an eye on their linkages to R&D processes at the systemic level. In a second step, I present some of the key empirical features of STIR as a set of engagement studies. I focus on the tools and practices built in diverse case studies, specially the practice of collaborative dialogue, and the protocols of interaction around which it is articulated. Concretely, I try to analyze in a conceptually and empirically detailed way the conceptual, discursive, praxical and material dynamics generated around the mentioned tools. This analysis will allow me to clarify the notions of modulation and reflexivity at the level of laboratory, and to distinguish STIR from other approaches to scientific practice within the traditions of STS, ELSI and ethics. Finally, I present a list of caveats and possible ways to move beyond them.

Responsible Innovation in Action: Contextualizing a Research Laboratory from within. *Qin Zhu, Dalian University of Technology*; *Carl Mitcham, Colorado School of Mines*; *Erik Fisher, Arizona State University*

The following paper reports on and analyzes an experiment in the social contextualization of engineering research and innovation. It begins with a simple narrative account of how a philosophy graduate student from China became an "embedded humanist" in an engineering research laboratory at the Colorado School of Mines, the reasons for receptivity on the part of the laboratory director, and some of the unexpected experiences that took place as a result. It then continues with an analysis of the laboratory in its social context, and concludes with reflections on the experience and its implications for future developments in a Chinese context.

Modulations of the laboratory: Institutions, interventions, and decisions in a Flemish industrial laboratory. *Francois Thoreau, University of Liège*

This talk represents and presents boundaries and distributions of decision-making processes in an industrial laboratory in Flanders, Belgium, both at institutional and individual levels. It employs a notion of governance understood through the perspective of political economy in terms of what produces structuring effects. It presents an initial typology of institutions, from formal to more informal institutions, and from constitutive or regulatory institutions to behavioral institutions. This framework will develop in conjunction with intense and interactive ethnographic fieldwork, begun in January 2010, which feeds ethnographic observations back into the field in order to explore the reflexive awareness of practitioners.

Biopolitics in a Canadian Genetics Laboratory. *Shannon Conley, Arizona State University*

In light of Canadian and provincial policies that call for consideration of social and ethical issues in the practice of science, this study examines capacities for natural scientist-social scientist collaboration and integration within a reproductive genetics laboratory located in the Canadian province of British Columbia. The laboratory engagement spans a three-month period during summer 2009, in which structured and unstructured interactions occurred during ongoing research decision-making. The interactions led to a number of integration outcomes with respect to scientific practice, including: the author gaining interactional and contributory competence in discursive and material practices, such as conducting scientific experiments; a change in laboratory patient engagement practices; increased reflexive awareness of laboratory members regarding their research; and continuing collaborations that have persisted beyond the official end-date of the project. Additionally, the engagement process allowed for integrations between policy and scientific worlds via discussions with practitioners regarding the regulation of scientific practice. Finally, stressing the potential costs for outsiders who seek to gain participatory access to laboratory decision making processes, the paper also describes the author's own encounters with what could be termed the biopolitical culture of the laboratory, in which the intersection of fertility research and fertility choices was experienced by laboratory practitioners and visitors against a backdrop of genetic determinism.

Chair:

Erik Fisher, Arizona State University

Discussant:

Alan Irwin, Copenhagen Business School

141. Introducing Biomedia Art in the Context of Science Communication

10:45 to 12:15 pm

5: 522

Biomedia art is a form of new media art, which uses bioscience as a theme or/and method, developing rapidly today. The aim of the proposed session is to introduce biomedia arts, now globally performed, and to discuss their possible implication and challenges in the context of science communication, based on the three presentations by artists themselves and a presentation about the experience of exhibiting biomedia art in the Institute of Medical Science of the University of Tokyo. Style of performance and its implication vary among each artist. That of presenters of the proposed session will be introduced in their papers. Thus I will introduce other artists in the followings. Eduardo Kac, who coined the term "Bio Art", "a new direction in contemporary art that manipulates the processes of life" (Kac, 2007, 18) in 1997, for instance, introduced a genetically modified rabbit as an art. In this famous "transgenic art" work called "GFP Bunny" (2000), Kac intentionally invoked public debate, to discuss over the issue of how we treat genetically modified life, as a part of his work. While Kac focused on the interaction between life and society, others focus different dimensions such as the function of life, meaning of life, the form of life and so on. A work of tEnt (Macoto Cuhara and Hiroya Tanaka), "Call <-> Response", for example, manipulates the function of bird's vocal code using computer interface technology. Marc Quinn's series of works entitled "DNA Portrait" show cloned human DNA extracted from existing figure including Quinn himself. Although there are varieties of approaches in biomedia arts, they commonly reflect how individual artists interpret "life" in biological sense. Interpretations of "biological life" by artists question the existing interpretation in society, possibly generating both personal reflections and public discussions over issues of "life", such as what is life, how we treat life, or how we create life. Thus, intentionally or not, biomedia arts are initiating communications concerning the issues relating to bioscience. It indicates the possibility to count biomedia arts as a form of science communication. In the context of science communication, biomedia art can be a provider of critical perspective. By initiating communication with an expression of individual interpretation of science,

biomedia arts propose an effective way of "mutual communication" in the broad sense, questioning the Enlightenment approach often taken by the activities of science communication. At the same time, biomedia art may need self-criticism to be a good communicator. Limitation of verbal communication in art, possibility to uncritically legitimize scientific knowledge, and the balance between ethics and the freedom of expression regarding the provocative method used by some artists are the examples of topics to be discussed in our session. Proposed session will be an opportunity to introduce "biomedia art" to the community of Science Technology Studies, and discuss its future in the context of science communication.

Participants:

Creation and Exhibition of Arts on Science at the Institute of Medical Science. *Yusuke Mori, University of Tokyo*; *Maiko Watanabe, Department of Public Policy, Institute of Medical Science, The University of Tokyo*; *Kaori Muto, University of Tokyo*

The aim of the proposed presentation is to discuss the implication of arts on science as a way of science communication, based on our experimental project to create and exhibit arts on science. Science communication is often defined as the activities to provide laypeople with information on science. There are various ways of science communication, including science writing, science museum, café scientifique, and so force. Although not commonly included in the category of science communication, arts on science inevitably communicate science to audiences through artworks. More and more contemporary artists are finding science attractive as a topic of their arts, and some of their works such as that of Eduardo Kac (2005) have gained public attention. Yet, the implication of arts on science as a way of science communication has scarcely been discussed. Our project was thus planned to observe arts on science as a way of science communication. In the project, a scientist provided an artist, who is specialized in painting and had no previous interest in science, with scientific knowledge on two topics, "genome" and "biological clock". The artist created nine paintings for each of topics, after communicating with the scientist for a month. As an unexpected consequence, the works created by the artist were not representing the knowledge he gained itself, but the image generated from the knowledge. The works were exhibited for four weeks in the October of 2008, attracting both experts and laypeople. The result of our project is analyzed focusing on the process of creation, which is one of the two dimensions of arts on science; creation and exhibition. Our project indicates that arts on science provide an opportunity to communicate science not only through exhibiting the artworks, but also through the process of creation. An artist, who is a non-expert of science, gains scientific knowledge in the process of creation. In this process science is communicated based on the deficit model, assuming that the artist lacks scientific knowledge. However, different from what may be expected, the artworks created by the artist of our project imply that artist transform knowledge he gained into the image generated from his subjective context. As Ede (2008) argued, art on science is the "honest individual response to science". We thus define that arts on science communicate science through subjective contextualization of science. Subjective contextualization of science provides a way to address the limitation of major preceding models of science communication; deficit model and contextualization model. While deficit model assumes that acquirers of knowledge lack scientific knowledge, contextual model assumes that they have social context to demand knowledge. Arts on science, on the other hand, focus on the possibility of individual layperson to response to the acquired knowledge based on their subjective contexts. We will suggest that by allowing subjective contextualization of science, arts on science can promote public discussions on science among laypeople, regardless of having scientific knowledge or social context that demands scientific knowledge. Arts on science can be a new model of science communication.

Biomedia Art as aesthetic "automatism". *Emiko Inoue, Waseda University*

Biomedia has been used in the art field for long time. Biomedia art would have some characteristics of the moment. Initially, biomedia are generative materials. Second, biomedia art could represent social problems that relate to current life sciences. I am producing artworks using biomedia in a biological lab at Waseda University considering the history of aesthetic thoughts. One could say that the history of contemporary art has been the history to produce new concepts. I have considered the generative property of biomedia art provides a developmental from of the "automatism" concept. The notion of "automatism" in the art field was proposed by Andre Masson, Joan Miro and Salvador Dali, aside the stream from Paul Cezanne to cubism. Automatism is typified by "automatic drawing" as a means of expression under the subconscious. With which the hand is allowed to move randomly on papers. The trend led to "action painting" represented by Jackson Pollock, Willem de Kooning, and Franz Kline, who spontaneously dropped, splashed or/and smeared colors onto canvases. Nowadays the concept of "automatism" has been still pursued in the some ways. Generative characteristic of biomedia could extend the concept of "automatism". I have featured this characteristic in my artworks, exemplified by my recent exhibition entitled "painting with " (2009, Tokyo). For creating this exhibition, I asked my family members and friends to collect microorganisms on their faces to be cultured onto low nutrient solid agar media. The donated microorganisms were further used as painting materials, or colors, to be grown on canvas. This artwork represents that the genesis of personal expressions comes from human connections, and provides an opportunity to ask what differs scientific observations from aesthetic one through, and what the essence of "seeing" is. In addition, argorithmic art is generically run by computer programming. It regards as generative art. Argorithmic art may suggest the expansion of the concept of aesthetic "automatism". Biomedia would provide a new insight of current state of argorithmic art. Thus, the concept could promote discussion through the concept of aesthetic "automatism" in the contemporary art field and in public.

Shifting Perceptions of Life - What Artistic Research Do? *Oron Catts, SymbioticA, The university of Western Australia*

As our knowledge of life and our technological abilities to manipulate it grows; our cultural perceptions of life are increasingly becoming incompatible with what we do to it. In other words; the growing application of engineering-logic onto life requires new ways of cultural engagement with as well as scrutiny of scientific and technological concepts of life. SymbioticA, The Centre of Excellence in Biological Arts, is uniquely situated to allow hands-on Artistic research with the life sciences. Based at The School of Anatomy & Human Biology, The University of Western Australia, SymbioticA is the world's first artistic research facility within a biological science department. . The focus on experiential engagement with life led SymbioticA to develop programs that would allow artists and social scientists access to labs and techniques usually reserved only to scientists and engineers. These programs include residencies, workshops, academic courses and public engagement through exhibitions and forums. Projects researched at SymbioticA range from the molecular to the ecosystem and anything in between. SymbioticA sets out to provide a situation where interdisciplinary research and other knowledge and concept generating activities can take place. It provides an opportunity for researchers to pursue curiosity-based explorations free of the demands and constraints associated with the current culture of scientific research while still complying with regulations. SymbioticA also offers a new means of artistic inquiry, one in which artists actively use the tools and technologies of science, not just to comment about them, but also to explore their possibilities. The talk will use some of these projects as case studies to understand how direct engagement with life, and in particular the involvement in manipulation of life for cultural ends, generate idiosyncratic situations that allows for different understandings of what is going on with life.

Biopresence, Common Flowers, White Out and other Biology-related Art Projects from the BCL. *Georg Tremmel, BCL*

BCL is a artistic research framework founded by Shiho Fukuhara and Georg Tremmel with the goal of exploring and critically questioning the relations, congruences and differences between the force fields of art, science and society. The main interest of the BCL are not so much the emerging bio-technologies itself, but rather their impact on the society, the public imagination and the personal self. The following short description of 3 projects should give an overview over the interests and the activities of the BCL. 'Biopresence' project was initiated in 2002, during the run-up of the 50 years anniversary of the discovery of the structure of DNA. We asked ourselves what kind of social implications biotechnology will have on our lives in another 50 years time, and as a result proposed Biopresence. The core idea is that DNA is a universal code and at the same time the essence of life. By transfering this code across species we can therefore reach a state of 'eternal life'. Biopresence worked out a technical solution to embed/store/encode a person's DNA within the DNA of tree, therefore granding the person's DNA another lease of life. Our interest was how these trees carrying human DNA would be perceived and treated by future generations. 'Common Flowers' project must be seen in the context of the commercial introduction of genetically-modified flowers into the cut-flower market. Novel variation of carnations and roses with blue petal color were created by transferring genes responsible for the blue colour from other flowers. We were surprised by the lack of response or comments, as we believe these flowers represent an important milestone: for the first time genetic engineering was not used to enhance the economic properties of the plant (yield, resistence) but to enhance the aesthetic values. By using DIY Plant Tissue Culture we are able to bring the cut-flowers back to life and turn these very special flowers into very 'Common Flowers'. The acts of releasing the common flowers into the environment - which is legally possible because of the permissions granted to the company who developed the flowers - we are creating public shared spaces - or 'Flowers Commons' - where the flowers can flourish and propagate. 'White Out' is the logical continuation of the Common Flowers projects. During our research we discovered, that the carnations, which formed the basis of the blue carnations, were originally white. 'White Out' investigates the feasibility of removing the previously introduced foreign genes, and the possibility of restoring the orginal, natural, white state of the flower.

Chair:

Maiko Watanabe, Department of Public Policy, Institute of Medical Science, The University of Tokyo

Discussant:

Akihiro Kubota, Tama Art University

142. Risk, trust and the scientific publics

10:45 to 12:15 pm

5: 523

tba

Chair:

Alan Irwin, Copenhagen Business School

Panel Members:

Brian Wynne, University of Lancaster
Sheila Jasanoff, Harvard University
Michael Lynch, Cornell University

143. Strategies from the Border Zone: Post-genomic Dynamism of New Biological Research

10:45 to 12:15 pm

5: 524

The impact of new genetics has been closely observed and discussed not only in relation to society in general but also in terms of the implications on related disciplines such as pharmacogenomics (Hedgecoe & Martin 2003), toxicogenomics (Shostack 2005), and so forth. In such cases, the advancements in genomics have forced researchers working in these areas to fundamentally reorganize their methods of research or even assume a new academic identity. Keeping this in mind, we designed our sessions to focus on the areas less studied by the STS researchers—areas where new post-genomic science has been emerging in the forms of chemical, nano, and synthetic biology. Distinct from each other in their origins, these areas are interesting starting points for comparison in terms of observing the impacts of genomic science far from its center. In this session, we focus primarily on the strategic aspects of scientific activity as scientists look to develop, standardize, and communicate their relatively local practices. In particular, we analyze two points; these are as follows. The first is a problem related to scientific tools and their standardization, especially in the case of chemical- and nano-biology. Chemical biology can be described as the counter-action of the chemists as they look to participate in the biology market by co-opting the ideas of tools such as arrays of chemical compounds, and chemical banks inspired by DNA arrays. We analyze the internal problems of research disciplines—we examine, particularly, issues related to their identity—and the friction between chemists and biologists caused by the introduction of these new tools. This ambiguous ontology of chemical tools is contrasted with another tool, AFM (scanning microscopy), that is usually used in the discipline of nano-technology. There is still considerable uncertainty as to the usefulness of this device in biological research. In the context of the studies on standardized packages (Clark and Fujimura 1992; Fujimura 1996) or "platforms" (Keating & Cambriosio 2003), the analysis of these uncertain tools will contribute to new insights in these issues. The second problem that is analyzed here deals with the issue of communication in these new biology disciplines. This is most evident in the case of synthetic biology, where the interaction between scientists, media, and focused groups can be studied in detail. The degree of association between synthetic biology and traditional genomic science can provide an interesting contrast to the way chemical- and nano-biology are linked; in the latter case, the lack of a clear demarcation between the two disciplines has become a thorny issue that impedes the strategic representation of these fields. By focusing upon the relatively marginal yet rapidly emerging areas of new biology (cf. Callon 2002), this session is expected to contribute to the understanding of the strategic aspects the modern scientist's activities in terms of the kinds of tools, communication, and culture that are prevalent today. This session may thus lead us to reconsider the premises of sociological researches on mainstream genomic science.

Participants:

Managing the Borderline: On the Cultural Practice of Emerging Chemical Biology. *Masato Fukushima, The University of Tokyo*

The purpose of the presentation is to analyze the background of the recent developments of chemical biology (CB). Founded by synthetic chemists in the US, its ultimate goal is to analyze biological phenomena with the help of small molecule compounds which control the function of proteins. Researchers believe that this would obtain a more accurate picture of intercellular activities than traditional genetic methods. To materialize this, it is necessary to employ new devices such as large banks of chemical compounds, high-throughput screening technology, and chemo-informatics. We discuss three points below: first, the complexity of proteins has made it difficult to find the proper small molecules to bind with them. Synthesizing chemical compounds on a massive scale in the US, from combinatorial chemistry to diversity-oriented synthesis, has not been materialized so far. Japanese researchers, in contrast, have persisted with their traditional methods of using natural products as a more realistic approach. The sides taken on the technological debate have followed the different research traditions of different nations. Second, the intersection between chemistry and biology gives rise to the thorny issue of initiative. The role of synthetic chemists could be limited to providing research tools such as fluorescent proteins, which some chemists feel unsatisfied with; the different epistemic cultures cause daily problems in CB research. Third, the superficial similarity between CB and pharmacology makes it difficult to properly define CB's relationship with drug discoveries. Some emphasize that CB is for basic research, others look at CB as a part of drug discovery. The latter interpretation then leads to skepticism on the subject of CB's originality as a new discipline. This case

study will contribute to the understanding of the rather neglected relationship between the role of tools, devices and platform formation (Clark and Fujimura 1992, Keating & Cambrosio 2003) and the cultural practices of scientists, both in the epistemic sense (Knorr-Cetina 1999) as well as from the national/historical standpoint (Geertz 1973; Polanyi 1958).

A Right Theory for the Job?:Emergence of Nano-biology with the Tip Device. *Aiko Hibino, Japan Society for the Promotion of Science, The University of Tokyo*; *Masato Fukushima, The University of Tokyo*

Alongside of the tide of genome science, there appear new movements in its peripheral region. Nano-biology, an interdisciplinary field between biology, medicine and engineering, is one of such movements and active in Japan. It can be characterized by the use of the tip device for grappling with biological phenomena never explained by genetic nor biochemical methods. This study examines processes of emergence of Nano-biology in which tip devices have been using for dealing with uncertainty in the peripheral region around genome science. We've carried out case studies in a Nano-biology lab in Japan. Relying on data from interviews, observation and literature, we've analyzed difficulties and strategies specific to the device-driven activities. Atomic Force Microscope (AFM) is focused on as a case of the tip device. AFM is a kind of scanning probe microscope, which gathers the image by feeling the surface with a mechanical probe. It is the foremost tool in applied physics e.g., semiconductor characterization. AFM have been applied in basic biology since the 1990's. The point is what AFM can do and how it's related to the biological problem are so unstable that people are still groping for how to use it in biology. We've found that there are difficulties in stability and in reliability in contextualization of the machine into biology. First, when the technology is in the emerging phase, it is hard to distinguish the applicable scope of research targets until further research is done. Second, it is difficult to justify the use of new technology for the existing journal community or the founding agency. We will also discuss strategies by which scientists mediate these difficulties, in the light of the rhetorical strategy and the organizational strategy.

Synthetic Biology from the Lab to Public Mind: Laypeople's Reactions to Information on an Unfamiliar Emerging Technology. *Peter Holtz, Department of Social and Economic Psychology; Johannes Kepler University*; *Nicole Kronberger, Johannes Kepler University*; *Wolfgang Kerbe, Johannes Kepler University*; *Wolfgang Wagner, Johannes Kepler University*

Based on data collected in an experiment in the 'Communicating Synthetic Biology' project (COSY) and on data from the latest Eurobarometer surveys, this contribution analyzes laypeople's Collective Symbolic Coping with an unfamiliar emerging technology. Synthetic Biology is an emerging field where biological artifacts are being engineered from scratch, In this project, eight scientists of Synthetic Biology were asked to write press releases, which then were offered to journalists who wrote newspaper articles on SB, which in turn were presented to focus groups. As synthetic biology has received little public and media attention so far, it provides a unique opportunity to study public reactions towards an emerging technology from the very start. The results show that, from the lab via the media to the broader public, communication is characterized by two important tendencies: first, communication becomes increasingly focused on concrete applications; second, biotechnology represents an important benchmark against which Synthetic Biology is being evaluated. Furthermore, more information on Synthetic Biology does not necessarily lead to more positive attitudes. The focus groups' opinions towards Synthetic Biology polarized after getting more information on this issue. In all of the groups, metaphors and narratives were pivotal in creating a shared representation of and a joint stance towards Synthetic Biology. Information about Synthetic Biology triggered similar apocalyptical and utopian narratives and metaphors, as did genetic engineering in the 1990s public debate. Synthetic Biology is perceived as a logical continuation of "traditional" genomic research. Genomic science finally seems to live up to the euphoric expectations of the media and the public towards genetic engineering of the 1990s. The results of the focus group study were extensively discussed with several of the scientists, who wrote the press releases. The group polarization effect was met with surprise by the scientists. More personalized forms of scientific education like open-door policies were proposed as a possibility to reduce public discomfort towards Synthetic Biology. Furthermore, some scientists emphasized that also natural scientists have to understand and to address people's sorrows and hopes towards the way a new technology like Synthetic Biology will affect their lives.

Postgenomic Microbiology: Infrastructure and Research Politics. *Francis Lee, Linköping University*

In the wake of the successful mapping of the human genome several new fields of inquiry have emerged. These new efforts draw on the new styles of research, the technological developments, and the organizational models of genomics. These lines of exploration have embodied the 'Big Science' approach to microbiology and depend on massive infrastructural investments. These infrastructures make possible high throughput generation of data, computational analysis and modeling of biological data, and the organization and classification of massive data sets. Proteomics and the sibling fields, structural genomics and population genomics, have been argued to embody a new research paradigm in biology (Diamond and Woodgate, 2005). This paper explores a postgenomic research project, the Human Proteome Resource, in Sweden. The goal of the project is to create a Human Protein Atlas (http://www.proteinatlas.org/) that is to map all the proteins in the human body. This research project has received in excess of 2 billion SEK in research grants. In the research politics as well as the organization of the research project infrastructures play a pivotal role. The funding the project received was connected to development of infrastructure and the infrastructure is used to facilitate a global organization of the project (annotations to the Atlas are done in Mumbai, India). Hence infrastructures are of pivotal consequence for the organization and funding of the project. Theoretically and methodologically this paper draws on the concepts of translation (Callon, 1980) and coproduction (Jasanoff, 2004). The point of departure is the coproduction of a group of researchers, a technical infrastructure, and a research political agenda which emphasizes big science, excellence and innovation. Here the focus is on understanding how the research infrastructure relates to politics, the organization of the research group, and intellectual property. This approach is meant to highlight the heterogeneous processes of research, which has led to specific modes of organizing research, patent strategies, and ways of creating scientific knowledge. The material that underpins the analysis are interviews, document analysis, and observations.

Science Fact, Science Fiction and the Changing Role of Bioinformatics in Genomics Research. *Cameron Michael Murray, York University*

The future of genomics research will be characterized by research projects that use virtual models rather than human bodies as their principal research subjects. Data obtained for the building of these models will come from a wide range of biomedical case studies and international genomics and proteomics databases. These factors will contribute to a significant shift in the role played by bioinformatics in the production of biomedical knowledge. Until recently, STS scholars have treated bioinformaticians as secondary technoscientific laborers, similar to laboratory technicians and engineers. Increasingly, however, bioinformaticians are being equipped to ask primary questions in biomedical research. It is therefore important for STS scholars to investigate how and for what purposes the databases and models built by bioinformaticians are being constructed. The present work is based on a four week participant observation I conducted of a

group of bioinformaticians at the University of Calgary's Sun Centre for Excellence in Visual Genomics (SCEVG). These researchers are building a four-dimensional (both space and time) atlas of human anatomy, which they refer to as the CAVEman. The goal is to have the CAVEman serve as a virtual research subject for the study of genetic diseases such as Alzheimer's. My treatment of this project will unfold in two parts, speaking both to the benefits and potential problems raised by the work being done at the SCEVG. In the first place, I will highlight how the CAVEman blurs the distinction between scientific facts and science fiction. I will argue that by using immersive virtual environments and building generic virtual models, SCEVG researchers are trying to produce complex, multiform narrative fictions describing biomedical processes. Secondly, my paper will explore the ethical implications of a future in which bioinformaticians play a prominent scientific role in the posing and answering of major questions concerning human health. I argue that SCEVG researchers are part of a growing sub-field of bioinformatics, known as translational bioinformatics. Translational bioinformatics is charged with developing methods for storing, analyzing and interpreting large quantities of biomedical data that can be used in the diagnosis and treatment of biomedical illnesses. It is my contention that translational bioinformatics has resulted in the convergence of bioethics and computer ethics. The implication is that, as a result of the increasing reliance on computerization in international biomedical research, questions concerning the physical well-being of human subjects need to be asked alongside questions concerning intellectual property rights, the implications of expert systems, and the quality and design of biomedical software.

Chair:

Masato Fukushima, The University of Tokyo

Discussant:

joan Fujimura, university of wisconsin, sociology

144. Intermediaries in action 2

10:45 to 12:15 pm

5: 532

Participants:

Configuring the 'industrial collective': a controversy on the use of Swedish forests, 1989-2009. *Mikael Ottosson, PhD candidate*; *Vasilis Galis, Dr*

We introduce a theoretical vocabulary highlighting a neglected area in industrial change theory, the outsider role. Industries cannot be fully examined without considering the influence of concerned groups, i.e. actors concerned with the industrial activity. Our empirical focus is a mature, stable, and highly homogeneous industrial sector, namely, the Swedish forest industry. We identify, analyse, and discuss the development and configuration of various truth claims and standpoints regarding the characteristics and potential uses of Sweden's forest resources, 1989-2009. We follow the translation of the forest industry from producing solely pulp and paper products to producing electricity, heat, and bio-fuels. We argue that, without the pressure of concerned groups and 'industrialists in the wild' on the industry, forest industrial activity would never have been reconfigured.

Determinants of Non-Local University-Industry Collaboration: An Analysis Based on Chinese Patent Data. *Wei Hong, Center of Science, Technology and Society, Tsinghua University*

Prior studies have found that information flows from universities to industry are to a large extent confined to the local area, suggesting special efforts are needed for university research to have a wider impact on industry. This study aims to study the importance of geographic distance in formal university-industry collaboration in China over the last 20 years and to detect the determinants of non-local collaborations between academic and industry partners. The main data come from the Chinese patent database covering 1985-2004, with a patent co-application by a university and a firm used as a measure of a formal university-industry tie. Using rare event logistic regression, I modelled the effects of geographic distance and other covariates on university-industry collaboration and tested several proposed explanations for the prevalence of local constraints on university-industry linkages. The results show that geographic distance is indeed an obstructive factor in achieving university-industry collaboration, suggesting the transaction costs associated with long-distance collaboration are an important factor for firms to consider when seeking their academic partners. However, as expected, multiple non-economic factors could intervene to attenuate that effect. First, the central ministries and the local governments are two sources of institutional forces that could impose or encourage university-industry collaborations without considering the geographic distance between them. Also, although the universities with high prestige are not of particular interest to industry, they do seem to be attractive when firms need to pay extra costs due to long distance between universities and firms. Second, social network resources of universities are helpful in connecting universities and non-local firms. Since the network resources are measured by universities' admitting radius, the result also tells us that graduated students are an important channel bringing in non-local industry collaborators for universities. Prior collaborations, as have been shown in many prior studies, are a strong predictor of future collaborations. The trust built in prior collaborations is strong enough to cancel out the negative effect caused by long distance. Third, information stickiness of the patent is negatively associated with the distance between university and industry. This suggests that firms might be aware of the difficulties in transferring sticky information and intentionally avoid choosing non-local universities when the technology involved has much sticky information.

145. Engaging Publics/Engaging Technoscience in the Asia-Pacific Region II: Indigenous Knowledges

10:45 to 12:15 pm

5: 533

Summary This session is the second of three sessions the new Asia-Pacific STS Network is presenting at 4S as a panel. This one is on Indigenous knowledges; the first and third sessions follow the same theme of engaging publics/engaging technoscience, but raise two other highly relevant STS topics in the Asia-Pacific: environmental sustainability transitions and techno-life sciences respectively. Contemporary technosciences governance requires new practices, different institutional arrangements, new networks and forms of public participation about technoscientific innovation. This session will explore strategies for engaging publics in technosciences innovation and governance and the understandings that inform those strategies in the Asia-Pacific region (that is, countries of Australasia, East Asia, SE Asia and Oceania) with regard to Indigenous knowledges. Papers provide critical analysis of engagement strategies across technical/non-technical boundaries and the way these boundaries are confounded and reworked in particular contexts. In that analysis, the papers reflect on the limitations of, or constraints to, inclusive particaptory approaches, reasons behind it, and on how public engagement in decision-making might be enhanced in/for the future. Central questions informing the session include: What are the particular challenges that we face in the Asia-Pacific region? What changing or new practices of technoscience governance are emerging and how effective might they be? What is the role of government and/or the role of civil society in technoscience governance? Do current developments suggest 'public talk' or a genuine move towards a paradigm shift in governance, and what are the implications of either? What trajectories of particaptory governance might contribute to better civic involvement in policy steering and result in better policy outcomes? Rationale Unique and complex technoscientific issues have created formidable social challenges for the future. For all their promise, technoscience innovations are immersed in controversy, public distrust, complexity, and scientific and social uncertainty, for example, GM crops, nanotechnology, hard water management approaches, wind energy, stem-cell research, neurosciences, cloning, tissue engineering, and so forth. The speed at which new developments demand attention is accelerating. These sessions address these important issues and social controversies for technoscientific governance which is an important area now being widely addressed by STS scholars, and aligns especially to the following key themes of the 4S conference: public engagement/social movement and

science, technology, and public policy. Contribution to STS The three Asia-Pacific STS Network sessions contribute to a key STS issue: technosciences and their governance at a pivotal time when the ground rules that connect citizens to the state are up for revision and reformulation, and when experiments with technoscience/society dialogue are available for critical analysis. In addition, the session highlights the Asia-Pacific region as a new focus of inquiry that departs from the usual focus on the US and Europe. The Asia-Pacific is an emergent and important area in world politics, trade, and technoscience development and because of its diverse cultures (both non-indigenous and indigenous) and socio-political contexts offers a valuable 'point of difference' (or 'politics of differences') for discussion on and insights in a contested localising-globalising world where technosciences are convergent.

Participants:

The In-between: Subjectivities, Identity and Positioning of Maori Scientists in Maori Knowledge Traditions. *Sarah-Jane Tiakiwai, University of Waikato*

As an open space of encounter, the idea of the "negotiated space" is where different worldviews can be mutually and beneficially exchanged (Smith et al, 2008). This idea of the "negotiated space" is being explored between matauranga Maori (Maori traditional knowledge or indigenous knowledge - IK) and science worldviews in the project Te Hau Mihi Ata. The negotiated space as an open space of encounters for dialogue assumes a certain level of understanding what constitutes the cultural divide between knowledge systems. From this, understandings are able to emerge from which platforms for negotiating the ethical and epistemological parameters of engagement at the interface of knowledge and value systems can be developed. The process through which we have been exploring this negotiated space has been through a series of facilitated exchanges or 'wananga'. The early phases of the project constructed these wananga around topics relevant to both matauranga Maori and science. This paper focuses on the observations made of the engagement between matauranga Maori experts and Maori practitioners of western-based science (Maori scientists) during these facilitated wananga. In particular, the paper explores the identity issues facing the Maori scientists, which are both layered and complex, as they sought to reconcile their own cultural knowledge competencies (including knowledge of Maori language, culture and cultural practice); to position themselves as scientists in an indigenous world which generally views science with suspicion; and to position themselves within their own group (other scientists). Through the project, Te Hau Mihi Ata, we suggest that the construction of identities - that is being a Maori and a scientist - is fraught when located within both matauranga Maori and science contexts. However, simply locating these tensions within the realm of identity politics is naive. We suggest that Maori scientists who aspire to or have worked within Maori communities and contexts (and thus fulfill the cultural notion of 'giving back' to their communities) must first negotiate their own subjectivities and positioning - as Maori and as scientists before they engage as Maori scientists in the matauranga Maori environment.

Supergrans and Nanoflowers: Reconstituting Images of Gender and Race in the Promotion of Biotechnology and Nanotechnology in Aotearoa New Zealand. *Jessica Hutchings, New Zealand Council of Educational Research*; *Karen Cronin, Institute of Environmental Science and Research Limited, NZ*

This paper assesses the use of intensive communication strategies to promote the social acceptance of science, particularly biotechnology and nanotechnology. It considers how gender and ethnicity are being used as 'tools' for science promotion, and discusses the intersections of knowledge and colonisation in marketing and public relations. We come to this analysis from diverse personal and professional backgrounds at the centre and the margins of the New Zealand science policy, regulation and communication. We present a series of advertisements, posters, and news media articles published in Aotearoa New Zealand during 2000 - 2008, a period of significant political controversy and conflict over public investment in new technologies. We illustrate how gender, ethnicity and nature are appropriated, re-presented, and re-constituted in an attempt to collapse the divide between the powerful world of science and the realm of everyday life. Reflecting a critical discourse approach and applying this to both images and words, we discuss these images as political text aimed at consumers and citizens. These materials use images of women, indigenous peoples and the biological world to promote science in a way which mitigates negative public concerns about controversial technologies such as genetic engineering and nanotechnology. Our analysis is informed by 'science, technology and society' (STS), critical discourse analysis, eco-feminist and indigenous scholarship. Our intention is not simply to describe and deconstruct these media subjects, but rather to highlight how they have been deliberately deployed in the public domain as part of a strenuously contested debate. These images contribute to and are constitutive of the social relations of technology. They draw on deeply rooted social archetypes to re-present a politically constructed image of science to defined audiences, notably to those with the most concerns about its potential effects. In a socio-political context characterised by continuing civic challenges to the representation and rationale of modern science, these communication strategies represent an increasingly influential dimension in the framing and governance of emerging technologies

After 'Geopiracy': New Paths for Confronting the Challenges Posed by the Digital Merge of Scientific and Traditional Knowledges. *Oscar A Forero, CESAGEN, Lancaster University*

'Geopiracy' was originally defined as 'the forcible theft of the territory of others' (Douglas Porteous 1981; Douglas Porteous and Smith 2001: 76). However, with imperial or neo-colonial enterprises using novel forms of appropriating natural resources and knowledge practices without the burden of territorial claims, the concept of geopiracy acquired new meanings. In this paper I want to contest Vogel, Robles et.al. (2008) provoking statement that: 'the free association of geopiracy with biopiracy is an effective entree into the evolving debate of Geographic Indicators in the Trade Related Intellectual Property Rights (TRIPs)'. I argue that when analysing the range and scale of problems arising when scientific and traditional knowledges merge into a digital format, such framing is insufficient at best and counterproductive at worst. In 2009, during the Indigenous Peoples, Science and Technologies panel of the Asia-Pacific STS Network Conference in Australia, the Digital Geographies Workshop and Lecture Series of Universidad Austral in Chile, and the Engaged Anthropologists and Indigenous Scholars Network Conference(Durham, UK) indigenous scholars, ethno-scientists and specialists researching the effect of digital technologies in society discussed and identified the need to analyse the implication of the digital merge of scientific and traditional knowledges in policy development and implementation of indigenous peoples' right to 'prior and informed consent'. And, more importantly, we referred to the need of developing a model of best practise to advice processes of digital merge. There are encouraging signs that we are advancing in such direction, for instance, The Guidelines for Ethical Research in Indigenous Studies from AIATSIS1 and The Code of Ethics from ISE2 (in addition to related provisions of the CBD3 and the Johannesburg Declaration4) have provided bases upon which Indigenous Peoples' Organisations, government agencies and other interested stakeholders have began constructing agreements, protocols and site-specific guides for protection digital information reflective of traditional knowledges, particularly in reference to Natural Resource Management. I argue that the increase of stakeholders' networking capacity across continents has helped providing empirically grounded responses to stakeholders concerns in a manner more effective than that of replicating populist's geopiracy claims. Two examples are The Guidelines for Indigenous Ecological Knowledge (edited by the Australian National University & The Jumbunna Indigenous House of

Learning) in Australia and the 'INCHIÑ NGUNEAL TAIN KIMUN', a protocol for the care and management of information generated through digital methods for the management of natural resources in Mapuche Pehuenche territories in the Chilean-Argentinean border, (a project advised by CESAGEN with the support of the Darwin Imitative of the UK).

Koia I Piri, Koia I Mau ART Values of Ngārara and GE Risk Analysis. *Mahina-a-rangi Baker, Victoria University of Wellington*

The risk analysis and egovernance of genetic engineering (GE) technology in Aotearoa New Zealand has been widely criticised for the failure to ensure sharing of power between Māori, the indigenous people, and the Crown. Māori communities are disengaged and disempowered by the dominance of Western science as a cultural value in the governance of GE technology, and tribal interpretations of the effects of GE are not given weight in decision-making. My research in the pursuit of a Masters in Environmental Studies has been conducted to fulfil my own tribal agenda; it investigates the effects of GE specifically to ngārara (insects and reptiles), and values, as perceived by my tribal confederation. A literature review and interviews conducted with members of the confederation of the tribes Te Ati Awa, Ngāti Raukawa and Ngāti Toa, illustrated that Māori hold a range of integrated values of ngārara; from being material based, to representing important ancestral influences, to providing restrictions and social control, to being the protector of the principle of life. The value system which forms the basis of the relationship between Māori and ngārara fundamentally conflicts with the Western scientific paradigm within which GE has been developed and promoted. Local interpretations of the effects of GE are related to a larger global context where highly valued genetic material and organisms such as ngārara are undermined in their value as mere commodities, and are subject to the hegemonies of global neoliberal and scientific powers.

Chair:

Jessica Hutchings, New Zealand Council of Educational Research

146. 6S Business Luncheon (Lunch provided)

12:15 to 1:15 pm

5: 516

*The Business Luncheon offers 6S conference attendees the opportunity to join together for a specially catered luncheon. This convivial gathering is an ideal occasion to meet fellow 6S members whom one may not otherwise have an opportunity to engage. The Business Luncheon furthermore provides an ideal forum for 6S counsel representatives to discuss 6S plans, events, and administration. During this years Business Luncheon the 2011-2013 student representative will be formally elected.

147. Global/Local Bioeconomies and Practices

1:15 to 2:45 pm

12: 1212

Participants:

Medicine for People and for Profit?: Modelts of Finance and Knowledge Production in South African Drug Development. *Anne Pollock, Georgia Tech*

Debates about neglected diseases have long been framed in terms a failure to meet the needs of the other: first world drug companies not investing in research toward treatments of diseases of the third world. When this problem has been understood as a conflict between profit motives and social good, advocacy has been for "medicine for people, not for profit." Yet many new initiatives have sought to align those two goals. This paper analyzes an initiative to train South African scientists in drug development for neglected infectious diseases, asking how lowering the cost of the scientific knowledge component of pharmaceuticals - rather than their production, licensing, or distribution - matters. How is a start-up model of meeting African needs distinct from a philanthropic model? How do critiques of the pharmaceuticalization of philanthropy remain relevant? How are interests aligning around initiatives like these, and cui bono? South African drug development provides a rich site for STS critique of pharmaceuticals, challenging us to account for transformations in finance and knowledge production as we deepen our systemic critique of global inequality.

NGOs and global/local circulation of patent drugs. *EunJeong Ma, Seoul National University*

This paper examines the role of Non-Governmental Organizations (NGOs) in the shaping and circulation of the pharmaceutical market. It is based on about a year-long ethnographic work on patients' rights advocacy groups and professional organizations concerned with fair and equitable access to drugs in South Korea. With particular attention to an anti-cancer drug developed and marketed by Novartis, the paper explores the ways in which NGOs contest the (enforced) global flow of patented drugs regulated by multinational pharmaceutical companies and come up with alternative ways of circulating drugs networked with local organizations situated in other Asian nations. In 2001, Novartis Korea tried to put an innovative cancer treatment on the market by registering it with the government authorities for insurance coverage. In the process, Novartis Korea and the Korean government disagreed on the appropriate price of the drug. Novartis's drug pricing policy was based on the A7 pricing system that is universally applicable to advanced countries, against which the Koran government was strongly opposed. Korea NGOs contended that Novartis's universal drug price hindered local citizens from accessing the drug. They asserted that multinational pharmaceutical companies should take co-responsibility to promote the lives of global citizens instead of protecting interests of corporations. To make their voices heard, they not only tried to network with activists beyond the national border, but imported alternative cancer drugs with similar efficacy as that of Novartis from Indian pharmaceutical companies. Thus, this paper follows through the performative actions of Korea NGOs and discusses policy implications.

The North-South Health Inequalities under Global Health Politics: A Pharmaceutical Industry Perspective. *WeiHong Wang, National Taiwan Normal University, Graguate Instittute of Political Science*

The current global health politics have been pervasive with a severe North-South disparity phenomenon. Developing countries have been suffering from infectious diseases; in particular tropical infectious diseases have been troubling those living in African countries. However, those are usually ignored by the governments and pharmaceutical companies of developed countries. This also leads to a long lasting North-South health divide and conflicts. Due to the economic globalization, the political powers from hegemonic countries are able to more efficiently broaden their overseas markets, especially through the overall global business arrangements of transnational pharmaceutical companies. Contemporary conflicts over IPRs shed critical light on the North-South divide of global health politics. This makes the power of hegemonic countries and transnational pharmaceutical companies able to build a structure of connections between each other. Current STS scholars have not as much as they might of the implications of the activities of patient groups and health movements for the reproduction or overturning of deeply rooted inequalities-by gender, race, nationality and region. There has been much less consideration of global health inequalities and health disparities. For instance, in recent years questions of access to new drugs have risen to the forefront of the STS agenda in both developed and developing countries, because of the high costs of pharmaceutical innovations. In addition, Big Pharma has been criticized for a research and development bias against drugs needed in developing country market. Undoubtedly above global North-South health inequalities have a profound influence on the shapes, goals, and success of patient groups and health movements of STS. This paper is divided into two sections. The first section will explores the influence and phenomenon brought on by the transitions of global public health system,

which are currently morphing from an international health politics to global health politics. At the same time, this paper also discusses the global North-South health Inequalities issues reflecting poverty and diseases in developing countries from the tension between these topics of human rights, public health, free-trade. The second section will examine the phenomenon of North-South health divide and inequalities and possible reasons for these, trying to find something from the demand aspect of global pharmaceutical markets. Therefore, what I wish to show in this paper is focused on the roles performance from developed countries and transnational pharmaceutical companies.

Asymmetrical convergence in global knowledge economy: A case of stem cell research in Korea. *Leo Dhohoon Kim, LSE*

The commercialisation of biotechnological research is undermining academic autonomy and limiting democratic reflection on scientific practice. In relation to the emerging knowledge economy, exploring how both global economic environment and national culture influence local research practice turns out to be of crucial importance. The Hwang scandal in South Korea illuminates a typical research practice geared towards the exploitation of labour and human resources in response to, and as part of, global competition in life sciences. This article argues that the ongoing exploitation of young talents and labour in the Korean academic community is the combined outcome of actors' interests, organisational power structures, and strategies of survival in the global knowledge economic system. Competition and exploitation are internalised in the governance of life sciences, despite avowed commitments for more rational and democratic research practice at the institutional level. Transnational reflection on how STS can contribute to enlarging the scope of ethical regulation of life science to the economic conduct an discourse becomes an important task.

148. Environment and Health

1:15 to 2:45 pm

12: 1213

Participants:

Contesting Body/health-environment Nexus: Discipline Building, the Epistemic Coalition, and the Institutional Change in Postwar Taiwan. *Li-Chung Cheng, Sociology, University of Chicago*

In contemporary Taiwan, environment and health are not coupled institutionally; they are coupled only cognitively. This study attempts to address why and how such discrepancy happened. The central analytical concept, the epistemic coalition, is mainly drawn from three bodies of literature on contested knowledge, discipline building, and the state as an epistemic actor. By employing this concept, this study tries to synthesize the merits of STS and institutional analysis and shows how the environment-health nexus was coupled, decoupled, and re-coupled in different epistemic fashions advocated by different coalitions. It aims to shed light on the crucial but under-explored role of epistemic-politics in shaping contemporary environment-health disputes. The introduction of epistemic devices and certain scientific methods into the disputes makes legible certain aspects of the environment-health nexus at the expense of others. My study attempts to show how this is the case of the decoupling that happened in Taiwan. In addition, by focusing on the rise and fall of a hegemonic epistemic coalition, the study will also try to demonstrate that long before main formal institutions come to change (e.g. in the form of legislation), certain epistemic works had come into play to pave the way for the struggle for a more profound institutional change. The data of this study is drawn mainly from archives and interviews. It focuses on three historical moments for the institutionalization of environment-health nexus in Taiwan: the formation of the environmental hygiene coalition out of the fighting against contagious diseases; the rise of the environmental analysis coalition (i.e. the rise of "the environment" and environmental engineering); and the emergence of health-risk-assessment coalition. The scope of Taiwanese environment-health professions is relatively manageable and feasible for inquiry of this kind. In addition, its rapid development from authoritarian regimes to democracy, from the rural to highly industrialized society within four decades make it promising for a processual analysis of epistemic-politics.

Monsters under the bed - Exploring the shadowy spaces around risk in public health and environmental impact. *Denis Fischbacher-Smith, CHERR - University of Glasgow*; *Moira Catherine Fischbacher-Smith, CHERR - Centre for Health, Environment, Risk and Resilience, University of Glasgow*; *Alan Irwin, Copenhagen Business School*

Debates around public health risk have, many cases, been akin to the monster under the bed - they represent the threat of harm, are surrounded by shadows of uncertainty, and are often subject to intense debates about their very existence. Conventional approaches to risk management often fail to address these issues, as there is insufficient a priori data available to make an effective assessment of the probabilities associated with the hazard. At this point, many commentators have argued that organisations should adopt a precautionary approach to dealing with the risks (Calman & Smith, 2001; Fischbacher-Smith & Calman, 2010). This paper will consider the main issues involved in the use of such a precautionary approach and the implications that it has both in terms of the manner in which organisations communicate risk and deal with the resultant 'shadow spaces' (Pelling, High, Dearing, & Smith, 2008) that surround policy debates. It is in these shadow spaces that much of the conflict around the expert judgements and the role and nature of science in decision making can be found. By surfacing the inherent uncertainty that exists in these debates it makes the use of a precautionary approach all the more significant. The paper will begin by setting out a series of issues around the role that science and expertise play in the shaping of policy debates. Of particular importance here will be the notion of the under- and over-critical models of science outlined by Collingridge and Reeve (Collingridge & Reeve, 1986) and the impact that corporate power may have in terms of shaping the inherent error cost (Collingridge, 1992) that is built into policy making around public health issues. Through a consideration of public health issues in the UK, the paper seeks to address the manner in which the precautionary approach can mitigate the power of organisations to shape policy debates within the context of public health-related risks and the role that 'citizen science' (Irwin, 1995) can play in offsetting the role that powerful interests can bring to bear on such conflicts. As such, the paper speaks to existing debates within STS around the public understanding of science, the role of expert judgements in policy making, and the manner in which risk is handled within societies. The paper sets out the implications that the precautionary principle has for public health policy and suggests ways in which by surfacing the inherent uncertainty associated with such risks, policy makers may develop more robust strategies for risk communication and management.

Poverty and the Challenge of Urban Environmental Health in Nigeria. *Geoffrey I. Nwaka, Abia State University, Uturu, Nigeria*

Poverty and rapid urbanization are two of the greatest challenges facing Africa today. UN-Habitat estimates that Sub-Saharan Africa cities have over 166 million slum dwellers most of who work in the informal sector where they simply do not earn enough to afford decent shelter and services. Health is a major urban policy issue in Nigeria because poverty and slum conditions pose a serious public health threat to the country's rapidly expanding urban population. In vast areas of Nigerian and other African cities environmental amenities lag behind population growth; inadequate sanitation and waste management, and the poor state of public health infrastructure have led to the spread of a wide variety of water-borne and other communicable disease. The paper considers ways to forestall the growth and spread of slums in the future, and ensure that the existing ones are upgraded and progressively integrated into the urban mainstream; how poverty which leads to slum conditions can be

alleviated in order to reduce the worsening disparities in access to health care. The central argument is that human development ought to be at the centre of the concern for sustainable urbanization in Africa. To achieve this, the paper considers how best to promote the growth of more inclusive and humane cities by reviewing discriminatory laws and codes which tend to inhibit the access of the poor to affordable land, health care and housing security. The concluding section cautions that the mere presence of health facilities in the cities should not be confused with these facilities being accessible to and affordable by the poor. It stresses the need for appropriate and well targeted urban health and other interventions by state and local authorities, the international development community, private and civil society organizations, and the urban poor themselves in a collaborative effort to build safer, healthier and more equitable cities

The concept of Mass Psychogenic illness : a denial of uncertainty in environmental health ? *Catherine REMY, Centre de sociologie de l'innovation-Ecole des mines de Paris*; *Yannick Barthe, Centre de sociologie de l'innovation-Ecole des mines de Paris*

The concept of « Mass Psychogenic illness » and its synonym « socio-psychogenic syndrom » are very often mobilized by the French health authorities to explain epidemics of unexplained symptoms. Whereas the epidemics are decribed by several actors as Sick Building Syndrome cases, these experts choose to describe them as socio-psychogenic syndrom cases. The purpose of this presentation is to interrogate this « etiological reduction ». The Sick Building Syndrome refers to a variety of minor symptoms which afflict workers in the workplace or in public buildings. In theory, the Sick Building Syndrome is caracterized by an unspecified etiology : it underlines a multiplicity of possible causes, environmental or psycho-social, which produce various effects. Then, this diagnosis of SBS can be and is often understood as an invitation to lead further investigations and inquiries. In France, nevertheless, the experts who intervene on the field defend a 'psychologization' which close the investigations and explain, once and for all, the origin of the symptoms. For us, it reveals a difficulty to deal with uncertainty, difficulty denied which impose a 'logic' of management rather than a logic of scientific exploration.

Yokkaichi Asthma Disease and Setting Environmental Standards in the 1960s and 1970s. *Danyang Feng, The University of Tokyo*

Postwar Japan experienced high economic growth from the mid-1950s that produced serious environmental pollution that caused deadly diseases. Yokkaichi asthma, one of the four prominent Kogai diseases, affected numerous patients and resulted in a legal confrontation between them and corporations at a petrochemical complex. The disease also compelled government officials to recognize the importance of epidemiology, enact basic laws concerning environmental pollution, and establish environmental standards in the 1960s and 1970s. In setting environmental standards, the government officials played an important role as policymakers while the experts served as science advisors. This presentation will mainly discuss the basis on which the scientific decision was made and how it was adopted as a regulation. It will also attempt to analyze the special roles of the investigators and experts. To improve the serious pollution situation in the Yokkaichi area and to set a proper standard for the emission of sulfur oxides, many scientists from different fields were mobilized by the government to conduct investigations and research. The most valuable data came from epidemiology. In 1963, the Kurokawa Investigation Group was dispatched to the Yokkaichi area, and the group's report provided a scientific explanation of the link between the residents' asthma attacks and the concentration of sulfur dioxide. Medical Professor Katsumi Yoshida from Mie Prefectural University carried out several epidemiological investigations in the Yokkaichi area, and his results provided critical data for the Kurokawa Investigation Group's report and later for the establishment of the emission standard for sulfur oxides. In November 1966, the Life and Environmental Council (LEC) in the Ministry of Health and Welfare assembled a panel of experts on environmental standards for sulfur oxides. The panel submitted its report in January 1968 and included advice about the threshold concentration for keeping humans healthy based on several epidemiological research studies. In July 1968, the LEC determined the sulfur oxide standard and described in detail the value of a percentage reduction. The next year, a cabinet council passed final standard values for sulfur oxides. The standard was made stricter in 1973 after the Yokkaichi legal judgment. In all this process, scientists and epidemiologists in particular played an important role.

149. Science, Technology and the Governance of Public Health Challenges (2)

1:15 to 2:45 pm

12: 1214

Participants:

The Measuring of Dangerous Personality: Civil Rights and Violence Risk Assessment. *Jin Yu, Virginia Tech, STS*

Confinement institutions have functioned in the West as an apparatus with which to control two major forms of deviance - crime and madness. Because confinement infringes on the fundamental right of an individual to her own body, which constitutes the basic principle of liberalism, the modern liberal state has endeavored to develop discourses on the question of legitimacy of confinement. In the 1970s, the growing movement of psychiatric patient advocacy yielded successful legal claims of the civil rights of the mentally disordered with a consequence that involuntary civil commitment was reduced. As an outgrowth of this development, "dangerousness" was brought to the fore as the only justifiable reason for committing an individual to a state mental hospital. The question of whether "dangerousness" justified incarceration, however, was not settled; but it instead planted the seeds of vehement controversies. Above all, the infamous vagueness of the notion left controversial the question of what constituted a "dangerousness" that would justify preventive intervention at the cost of individual liberty. Among related issues was the predictability of human behaviors. In the process of constructing the problems of violence and dangerousness, psychiatric discourses were drawn on to explain how social injustice and inequality produced violent behaviors, on the one hand, and the social and behavioral scientists problematized the clinical expertise of mental health professionals in predicting the dangerousness of criminals and the mentally disordered. As the authority of psychiatric professions was being undermined since the 1960s, critics of institutional psychiatry brought into question the expertise of psychiatric professions to predict violence. Faced with those challenges, psychiatrists involved in confinement institutions set out around 1980 to develop the language of risk in an attempt to replace the politically tainted standard of "dangerousness." The newly embarked enterprise of violence risk assessment studies attempted to develop "neutral" science so as to adapt to changing political and institutional demands. In so doing, psychiatrists and psychologists devised new techniques of detecting and managing dangerous individuals, leading to the formation of violence risk study as a subarea of forensic psychiatry. In this process, a transformative interaction occurred between the concept of psychopathy and the approach of violence risk management in a way that reinvigorated the psychopathy category as a reliable predictor of future violence and that conceptualized violence risk as originating in dangerous personality.

Who are the Blind? A Study of the Changes in Blindness Assessment in Taiwan. *Tasing Chiu, Kaohsiung Medical University*

In the past 120 years, the procedures for assessing and classifying the blind in Taiwan have gone through several transformations. Blindness was among the first group of disabilities identified by British missionaries, and the first special school for the blind was established in 1891. During the Japanese colonial period, from

1895 to 1945, police doctors were responsible for defining, through the census, who the blind were. After the takeover by the Chinese Nationalists, the definitions and classifications become more diversified, as different institutions served different purposes. Starting from 1980, all the disabled were given disability certification and physicians in public hospitals have acted as gatekeepers of social welfare and insurance benefits. Currently, the Taiwanese government have decided to follow WHO and adopt ICF (International Classification of Functioning, Disability and Health) standards for classifying people with disabilities. Assessing blindness has become a coproduction among various professionals. As will be shown in this study, blindness and, more broadly speaking, disability are both historical products of the interaction of body and social-cultural environment. These classification schemes are also responsive to changes in medicine and medical technology in many ways. This study will apply the "social worlds" framework to examine the meanings and content of disability within a historical framework, to carry out a fine-grained analysis of these classification systems, the organizational contexts of their application, and the political and social roots of that context in Taiwan.

The Science of Fisheries and "Minamata Disease General Investigation and Research Liaison Council". *Hiroshi NAKANO, University of Tokyo*

Minamata disease occurred because inhabitants consumed the polluted seafood. The official confirmation of Minamata disease was in 1956. However, the material cause of that disease was uncertain at that time. The Minamata Food Poisoning Sub-committee, under authority of the Food Hygiene Investigation Committee of the Ministry of Health and Welfare, determined the material cause of Minamata disease to be a certain kind of organic mercury in 1959. The sub-committee was dissolved after their report. The discussion about the investigation of the cause was performed in a conference initiated by the Economic Planning Agency, which was titled "Minamata Disease General Investigation and Research Liaison Council". The Participants were eight scientists; four fishery scientists, two chemists, and only two medical scientists, which implied that only examination of the organic mercury was to be discussion. Sciences of Fisheries were related to environmental problems for the first time by the Minamata disease. A scientific discussion was done concretely between the medicine and the sciences of fisheries in that same place. Four fishery scientists were UDA Michitaka, NIINO Hiroshi, MATSUE Yoshiyuki and TOMIYAMA Tetsuo, who were professors of university. The conference, in which those scientists participated, was held four times from 1960 to 1961. In the first and second conferences, the organic mercury research from a medical perspective progressed in cooperation with fishery sciences. In the third conference, it was reported that UCHIDA Makio, professor of Kumamoto University, had found organic mercury crystal in the shellfish found in Minamata-bay. He was expecting that the sciences of fisheries supported his study. But authorities of biochemistry and medicine in the third conference criticized UCHIDA's research. At the fourth conference, reports contradicting his research were presented. Although those anti-UCHIDA reports were not verified, AKAHORI Shiro, the highest authority of biochemistry, not only accepted them, but also expressed doubt in the organic mercury causal theory. Therefore, this theory was recognized as uncertain. At this time, the sciences of fisheries that were able to support UCHIDA's study had been excluded from the conference. In this announcement, the verification of the reason why the science of fisheries is excluded from scientific discussions of that conference is tried.

Traditional-Alternative Medicine and Health. *Jae-Mahn Shim, University of Chicago*; *Eunjung Shin, University of Illinois at Chicago (UIC)*

Why do certain populations live longer than others? Social science studies of population health provide various answers, such as economic wealth, national health care investment, the amount of medicine, education, civic associational capacity, or income equality. Empirical evidence, however, indicates that these accounts are still disputable. Acknowledging this, this paper proposes a cultural-institutional perspective with the specific purpose of not only addressing this question of population health from a different viewpoint but also engaging questions about the social ramifications of cultural, institutional diversity in science studies. The cultural-institutional perspective posits that the collective character of cultural frames of body, especially those of ailing and healing (i.e. medicine) affects population health and that the diversity of these cultural frames has consequences for population health. At the same time, this paper conceptualizes medical institutional plurality as the degree of the co-development of traditional-alternative medicine (TAM) and bio-medicine in order to incorporate the increasing interest in the health effects of TAM institutionalization into health care systems. Although ethnographies document that TAM and bio-medicine develop simultaneously in health behaviors and professional practices in a potentially functioning manner, the population health consequences of TAM have not yet been systematically addressed. In an effort to fill this gap, this paper addresses whether the medical institutional plurality contributes to population health. Based on a cross-national dataset of 81 countries, this paper found that TAM institutionalization by itself - or bio-medicine by itself - has no significant relationship with population health measured by national life expectancy at birth. Instead, the co-development of TAM and bio-medicine has a significant positive effect. Based on the findings, this paper develops several possible pathways through which medical plurality affects population health while either bio-medicine or TAM does not on its own. It highlights psychological as well as social processes that help advance science studies about social consequences of plural knowledge and science.

150. Performing Positioning: Thinking through applied social research in commercial scientific and technological settings

1:15 to 2:45 pm
12: 1222

Researchers working in complex socio-technical environments - as either a condition of their own knowledge production (e.g., those in high-tech university or corporate research centers) or as sites of their investigations - have long been concerned with how they are positioned. Issues of positioning range from politically charged questions about whose interests are being served to broader conceptual and theoretical concerns for how the work is or isn't positioned to affect the thinking, practices, and directions of broader intellectual traditions. The border-line between so called 'pure' and 'applied' research has acted as a particularly active, and at times overly reductive and divisive, boundary for thinking about the concerns and challenges to be addressed. Industry-based practicing social researchers, including ethnographers, have a long history with the complex, and often invisible, work of positioning and repositioning social research in the context of interested/invested business and scientific developments. They do so with an eye to advancing knowledge production in traditions of critical inquiry, and with an aim (indeed, a requirement) to affect change within those contexts. As such, they have been developing skills and building expertise in negotiating varied and often subtle forms of engagement and intervention. As applied social researchers work inside of and with often powerful and interested players whom themselves operate through complex socio-technical assemblages, how are those positionalities negotiated and managed? What challenges and limitations exist, and how do they shape the form of the research and its results? Building on previous arguments developed in a 2009 edited volume, Ethnography and the Corporate Encounter (Berghahn Books), in this panel we expose and reflect on performances of positioning among applied ethnographic researchers with an aim to explore broader considerations of the positioning of social research in complex socio-technical contexts. We consider factors pushing the practices of applied social research in new directions to explore of the following kinds of questions: * What particular skills have applied social researchers developed to reframe and/or advance their efforts and results? * In what ways do specific employment or professional settings enable or prohibit their ability to disrupt hegemonic frames of understanding, and when is or isn't (or should

or shouldn't) such disruption be the goal of their efforts? * Is there a way of conceptualizing the temporality of positioning social research in complex socio-technical contexts? Applied social researchers have decades of experience in these arenas; is there a past, present and future of these experiences to be explored and analyzed? * How do applied social research position themselves vis-à-vis prevailing practices and ideologies of academic discourses? Participants have all worked actively in applied social research for many years, primarily as ethnographic and anthropological researchers, analysts, and strategists. They draw on specific examples from their work to illustrate their arguments.

Participants:

Schoolmasters, Angels and Demons: Pondering the performative function of applied social research in the corporate encounter. *Melissa Cefkin, IBM Research*

Technical and corporate organizations seek out social researchers with explicit aim of developing new concepts, ideas and approaches to routes of change. Anthropologists, for example, play a role in everything from product innovation to organizational change. Lying beneath organizations' explicit requests, I believe, is a sense of the inadequacy of some of the dominant epistemic frames guiding their worldviews and the modus operandi of businesses and organizations more generally. These include a predominant focus on the individual as the fundamental unit for true understandings of actions and attitudes, for instance, as well as highly functionalist and rationalistic assumptions about the nature of organization and change. However sporadically and inarticulately, these mechanistic, hyper-rationalistic epistemic frames are confronted by a sense of their insufficiency in explaining some, if not a great deal, of what actually occurs and how things actually happen. Indeed, alternate discourses - concepts borrowed from complexity and chaos theories, those drawn from biology (virus, contagion) - often find their way into organizations. These discourses too, however, are often found to be difficult to use in framing actual alternate approaches to corporate actions. I suspect that it is in part here that social, specifically anthropological, modes of understanding are sought as organizations desire to try out a new lens. In this paper I consider how the actions of social researchers in corporate contexts operate according to varying discursive tropes to ask about the forms of engagement, and their efficacy, for the organizations. I illustrate these assertions through examples drawn from applied ethnographic work in technical, commercial settings. A practicing anthropologists' common response to the objects of organizational concern is to problematize them, decentering existing explanations so as to reframe understandings and give rise to new routes to solution. This trope operates according to the logic of "the corrective", a schoolmaster's finger-wagging, an analysts' authoritative report. Alternatively, it is worth considering the performative function of the observing ethnographers' and socially guided analysts' presence on the ground. Here the fly on the wall gives way to the angel on the shoulder, infusing the role with the air of a moral compass. The trope of the corrective dominates. It demonstrates and preserves the social researchers' voice as expert and allows for a relatively clear (but still palatable to the sensibilities of analysts steeped in traditions of critical theory) route to prescription. The efficacy of such an approach is recognizable and legitimate to corporate interlocutors as well as being most compatible with the critical discourse of the academy. It is less clear, however, what to make of the angelic (or, in rare instances, demonic) stance. I do not suggest that a choice must be made between these stances nor that people act consistently in one mode or the other. Rather I wish to explore different ways of performing critique, starting here with a consideration of the potentially facilitative role played by social researchers in the embodied and discursive performing of their own work.

Writing on Walls: The materiality of social memory in corporate research. *Ken Anderson, Intel Labs*; *Dawn Nafus, Intel Labs*

In this paper we pick up on the question of the embodied nature of ethnographic work to explore the materiality of ethnographic practice within large a technology firm. We seek to articulate a ground that is neither of the overprescriptive best practices in uses of ethnography genre, nor, as Cefkin (2009) describes it, "one of angst-ridden hand-wringing about researchers' moral and political complicity." We present our contribution to the volume Ethnography and the Corporate Encounter (2009) here in order to reflect on the use of physical, three dimensional space to write, display artifacts and media, and draw as a part of the positioning work done by social researchers in applied, corporate settings. Though used differently in different places, the practice of writing on walls has become a constitutive part of being an ethnographer in many industrial contexts. Walls have become places to think with, think through, and perform what it is researchers are thinking about. We attempt to go beyond the commonsense understanding of notetaking and photograph making as simple mnemonic devices by exploring how social relations happen in the interstices between text, visual material, and orality. This leads to a position to consider some ways that social memory plays a role in capitalist organizations. These organizations are usually seen as destroyers of the past rather than holders of it. Farms are bulldozed to build factories; traditional craft knowledge is replaced with assembly line labor. Yet here remembrance plays an eerily significant role. Here we treat memory as embodied practices of reminding and forgetting, as practices that migrate between the visual, the aural and the kinesthetic. Through each of these migrations, memory enchants and enrolls, affording the possibility of forgetting that the seemingly new is actually quite old. In this way, we argue that practices of "innovation" as described in the business and design literature and enacted in multinational corporations, are social practices that treat the past not as a constraint from which innovators break out, but a fecund resource with which heterogeneous actors entangle one another.

Modest Interventions at Scale. *Jeanette Blomberg, IBM Research*

The raison d'être for corporate research centers is to bring about change in time scales that range from months to years. The view is that new knowledge provides the basis for change whether in the area of chemistry, physics, computer science or the social sciences. The corporations, who sponsor the creation of new knowledge through research, it is argued, will have a competitive advantage if not directly through new products and services, then indirectly by getting a jump on the competition by capitalizing on disruptive scientific or technological advances. Those of us who work in or for corporate research centers of large companies (e.g. IBM, Intel, Microsoft, Google) find ourselves in the business of making change, but not just any kind of change. The change that is sought must make sense in the context of the dominant logic of these companies and the business models that propel their success. The high tech companies that I have worked for view technology as the driver of change and affirm the logic of positivism as the arbiter of action. Their business models require continual growth and stable profit margins brought about by expanding market share and cost reductions. With annual revenues in the tens of billions of dollars, coupled with high expectations for growth, these companies demand that research has the potential to bring about change on a very large scale. Drawing on my experience as a research staff member and manager of research at IBM this paper examines courses of action taken to position research for "success" within large technology companies so that it retains the sensibilities and commitments of anthropologically-motivated social research while responding to the environmental constraints of highly technocratic, scientistic, and growth-driven organizations. I offer a critical reflection on why a strategy resisted at first, but later embraced, requiring that new knowledge, the driver of change, be materialized in a technical object led to organizational legitimacy and an acknowledgement of research accomplishment. The presence of a technical object created a familiar and trusted terrain among research colleagues and projected the possibility of travel deep inside the company, carrying with it research insights capable of bringing about

change. Our proposal was to smuggle in the ethic of located accountabilities under the guise of a standardized framework for action. By embedding the sensibilities of locally-defined, modest interventions within a technical object with enough recognizable structure to traverse locales, we aimed to provide the possibility for change at enterprise scale while adhering to the view that meaningful change is always situated in a particular time and place.

Making Trustworthy Claims Out of Black Boxes. *Rick E Robinson, Sideriver Ventures*; *Maria Bezaitis, Intel Corporation*

Positioning is fundamentally a narrative act that makes a claim about identity and aspirations, while characterizing the field against which these claims might be evaluated. As an explicitly interventionist element of modern advertising and branding, the end goal of positioning is often given form in statements called "missions" or "charters" which serve to identify expertise and intent in a single, usually quite wordy sentence. In the corporate world and for the ethnographic research capabilities allied to it, positioning is rarely (intentionally) comedic, but often dramatic, rarely flexible, but often ambiguous, more than willing to appear desirable without making specific promises. It tends towards the absolute since anything else would read as a noncommittal. Positionings don't just extend a language of claimed expertise, they imply the shortfalls of our interlocutors' current approaches and attempts to create some urgency in the need for their consuming audiences to change. They represent a call to arms; a collective cry of Let's Go Here, Instead! Ethnographic work in industry is a broadly used descriptor, covering a welter of distinct practices and 'products,' little consistency of terminology and a scant canon of common foundations. The core of this paper will be a close analysis of the positionings and value statements that ethnographic enterprises are diffusing, with a focus on the connections between actual methodology, effect or outcome claims, and the various rhetorics of power, instrumentalism, control, and humanistic understanding that are attached to these claims. Not because we want to 'debunk' them, but because we think that expectation for the value of work should have a bar set very high, and very clear. What do the methods-based claims being made today actually help to achieve and can the projected "consumers" of this work actually make a well substantiated choice? As companies invest in new kinds of research and developmental work, applied ethnographic research groups need to take care that methodological and disciplinary labels don't obscure important differences in values, stance toward the people represented in the studies, or the expected outcomes associated with the work. Our argument is that positioning in research should imply a clear and apprehensible set of values, that practices can and should have their positioning explain where and how they expect the future to move and not simply reside in some shared notion of expertise. What this work offers to the STS community is an understanding of how ethnographic research has evolved to dress itself up for corporate consumption and how and why it might assume a new accountability to be clear to its audiences in spite of the difficulties that result. As ethnography expands its footprint in the private sector, positioning must be accompanied by standards set by the professional community of practitioners that frame the expertise and skills required to deliver specific forms of value inside organizations (public or private). Even without the sort of professional organization that enables the moral force of something like the physician's Hippocratic Oath, we who practice this work need to have our claims trusted.

Chair:
Melissa Cefkin, IBM Research

Discussant:
Nina Wakeford, Goldsmiths

151. Design

1:15 to 2:45 pm
12: 1232

Participants:

Reason, Resistance, and Reversal: Metaphors of Technology in Design and Law. *Hamid Ekbia, Indiana University*; *Harmeet Sawhney, Indiana University*

Metaphors pervade all aspects of technology — from design and development of artifacts to the cultural, legal, and economic environments that sustains them. But metaphors are also pregnant with paradox, as Derrida has famously demonstrated, carrying with them hardy seeds of loss, erosion, and mutation. The paradox has to do with the economy of metaphor, where profit produces loss, and where metaphor promises more than it gives. It does this by hiding its origin, which is always sensory and material. To reveal the origin, an effective strategy is "reversal" — that is, to spotlight what is being marginalized, without trying to debunk what already exists. Reversal, however, proves to be difficult to implement, as there are always mechanisms of resistance at work. These mechanisms manifest themselves differently in various arenas. We examine in two such arenas — law and design — with the intent of identifying their distinctive features, but also revealing their common socio-material character. In law, for instance, past cases set the precedent for future ones and the legal principle stare decisis, an abbreviation of stare decisis et quieta non movere, requires of the judge "to stand by and adhere to decisions and not disturb what is settled." Therefore changes occur incrementally and it takes a long time before a dominant metaphor is de-centered and intellectual insurgents are able to take ideas from the margins to the center stage. In effect, reversal in the legal arena has to overcome resistance marked by the peculiarly heavy weight of legal precedence. Similarly, the arena of design also has resistances, albeit very different from those in the legal arena, that make it hard for technologists, developers, and users to change their perceptions and expectations of technologies. Given the ubiquity of metaphors in technology development, a better understanding of these mechanisms can help STS scholars in their involvement and intervention in development and policy in the global context.

IO design: Workplacedesign that gives both high efficiency and good HSE results? *Dr. Berit Moltu, Statoil, Technology and New Energy*

'Integrated operations' (IO) is about employing real time data and new technology to remove barriers between disciplines, expert groups and the company. In this paper we investigate the effect of design and work practice in operation support rooms on efficiency and HSE. A study in the Oil & Gas Company StatoilHydro shows an evident correlation between IO design, high efficiency and good HSE results as it comes to a good work environment. The open discussion further is wether a good IO design can give further HSE results as it comes to risk management. This study shows the difference in design and practice between five different operation support rooms (OPS rooms). The operation support unit is supposed to support interaction between different locations, e.g. onshore and offshore in the upstream oil industry. Recent practice has established special OPS-rooms to do operation and maintenance work more feasible between the land based operation unit and the offshore operations. In this study modern academic perspectives from Science and Technology Studies (STS) are taken into the field of HSE. Inspired by Actor Network Theory (Bruno Latour, 1987, 1994) the OPS-rooms are seen as a process and a chain of network between different physical locations, different ICT-solutions, different organisational and managerial models, and new working practises, all supposed to support the current operations. The IO solution is supposed to support and create new ways of working based on realtime data, online communication and across geographically distance. This opens up for transparency in solutions e.g. to open up frozen borders between different departments, different disciplines, different geographical locations, management and employers, ICT and ideas of what a room is. Important design criteria for a good solution is to be Transparent, Symmetrical and Simple, and it is

supposed to support Flexibility and Fun. This paper challenge the traditional essensialistic studies on managementconcepts and workplacedesign as either good or bad. It's rather the process and the network of an IO design that desides wether it becomes a good or a bad place to work. The variety of solutions and practices was studied by participative observation in all five rooms. More than 40 employees working with operations support onshore and offshore were interviewed. A survey was made on efficiency of operations and maintenance work, optimalisation of production, and management of asset integrity and technical disciplines. Analyses of the results on efficiency and job makes us conclude that the assets performing good when it comes to efficiency, also performs good on a good work environment as it comes to psycological job demands (Thorsrud, 1977, AML §12). We attribute this to a more online and proactive work practise. The interesting next discussion is how this also may influence risk management, we belive that a online and proactive jobpractice also might positively influence risk level.

How Contract Manufacturers Matter: Design-Manufacturing Knowledge in the Taiwanese Laptop Producers, 1988-2008. *Ling-Fei Lin, Cornell University, Science and Technology Studies*

This project aims to disclose hidden processes in the making of laptops and the "invisible" role of contract manufacturers (CMs) in the history of computing by examining the knowledge production embedded in the practices of making laptops in Taiwan from 1988 to 2008. During this period, the proportion of worldwide laptop computers produced by Taiwanese manufacturers rose dramatically from zero to over ninety percent. Taiwanese CMs did most of the engineering and manufacturing efforts to produce the product. However, their contributions largely remain unknown to customers and little academic research focuses on the topic. It is largely assumed that production is just a matter of the "execution" of pre-existing rules and knowledge which downplays the social, political, and local cultures. In historical and social studies of manufacturing, topics such as manufacturing-process innovations and the craft of workers in the factory are well researched. In the history of computing, the extreme difficulties regarding manufacturing rather than design in the areas of semiconductor and nanotechnology have been scholarly foci. But beyond those, there are few voices of manufacturers in the history and sociology of technology. The situation is even more serious for contract manufacturers. This project will attempt to redress the balance by examining the complex design-manufacturing knowledge Taiwanese CMs generated while making laptops from 1988 to 2008. Special attention will be paid to unpacking actors' categories of cost, efficiency, and flexibility in the form of local knowledge in their practices in history. The role of CMs is much more than passive in the production of laptops. Using semi-structured interviews and document analyses, this project will conduct oral histories and analyze documents to write a history of local knowledge of CMs and knowledge circulation between Taiwanese CMs and their brand-name customers in the United States. This project will contribute to the STS literature by making visible the "blackboxed" process of contract manufacturing in the history of computing. The traditional hierarchy of knowledge between research, design, and manufacturing will be subverted through the exploration of local knowledge and the circulation of knowledge in the Taiwanese laptop industry. In addition, the project will explore the paradoxes raised by the highly globalized market for laptops and the concentration of laptop manufacturers in one place (Taiwan). This project also will contribute to technoscientific policy making by giving a better understanding of manufacturing, to area studies by focusing on the economic activities of greater China, and to the exploration of firm-to-firm relations under the contracting connections by examining the role such as trust and reputation in determining the cooperation between CMs and brand-name customers. Finally, since contract manufacturing makes up a significant proportion of the economic activities of some newly "developed" countries (such as Taiwan and South Korea) and "developing" countries (such as China and India), a deep examination of the important activity can help to recover these countries' agency, dreams, and histories, rather than viewing it merely as passive execution of rules.

152. Research Funding and Priority Setting

1:15 to 2:45 pm
13: 1312

Participants:

The European Research Council in the making: Building the legitimacy of a new science funding organization. *Terttu Tellervo Luukkonen, The Research Institute of the Finnish Economy*

The European Research Council (ERC), established in 2007, is the first European Communities' funding body set up to support investigator-driven 'frontier research' in all fields of science including social sciences and the humanities. Traditionally the research programmes funded by the European Communities under the umbrella of Framework Programmes have supported targeted (mission-oriented) research in specific research areas and have been based on cross-country and cross-organisational collaboration. The ERC is thus in many ways a path-breaking funding arrangement within the European Communities. There are other European-level funding organizations, which are however, intergovernmental by nature. This paper will focus on the institutionalization of the ERC and, in particular, the building of legitimacy of the ERC. It will pay attention to the ways in which central stakeholders - institutional agents - define the role of the ERC with respect to the other funding organizations and arrangements. In essence, it is a question of embedding the ERC in the social and organizational environment. It is argued that the means to ensure the legitimacy of this new evolving organization/institution includes the definition of the mission of the ERC in a way to avoid direct competition with existing organizations in the field thus avoiding overlapping roles and functions. Legitimacy is further expected to be based on the organizational goals being in accord with wider societal values - here on the traditional basic scientific and scholarly values - or on the structural and procedural aspects of the organization (Scott, 2008), e.g., the strict peer review processes and its selectivity. In essence, legitimacy is based on others' perceptions of the organization. It is expected that the emergence of the new funding body will cause changes and repositioning among the existing funding organizations, aiming to ensure their continued legitimacy. There will thus be mutual processes of definition, redefinition and negotiation of the roles and functions of the different European funding organizations. The paper aims to build a conceptual frame to analyse the discourse on the building of the legitimacy of the new funding arrangement vis-à-vis the existing organisations. When structuring the discourse, the paper will draw upon institutional and organizational studies. The study draws on a set of exploratory interviews (around 25) with central stakeholders in European research policy. These interviewees include, besides those in charge of defining and implementing the strategy of the ERC, people in charge of other European funding organizations or in European-level academic or industrial associations giving policy advice. The ERC provides a unique study object of an institution in the making, which will potentially become an important European science funding organisation. The paper will contribute to the literature of STS through the application of different sociological perspectives to the specific, new study object and through its analysis of current European research policy discourse. Acknowledgements: The study is part of the project entitled EURECIA, funded from the EU FP7 IDEAS programme (www.eurecia-erc.net) Reference: Scott, W. Richard, 2008. Institutions and Organizations: Ideas and Interests. Los Angeles, London, New Delhi, Singapore: Sage Publications, Third Edition.

Deciphering the meaning of "high risk" research in national and international contexts. *Mary Elizabeth Hughes, Science and Technology Policy Institute*

Recent history has seen an explosion in the establishment of funding programs designed to stimulate "high risk, high reward" research. The interpretation of high risk research, and subsequently the design and implementation of programs aimed to promote it, however, appears to vary quite considerably both within and across national systems. For example, a recent scan of programs using the designation of high risk research in United States federal agencies revealed a diversity of mechanisms that could be cataloged into four types: (1) seed funding at small scales over short periods for preliminary testing of novel ideas; (2) liberal, unburdened resources given to individuals with a proven track record; (3) large scale funding for projects requiring interdisciplinary teaming; and (4) staged projects with strong program management tracking the research projects, allocating funds as necessary to complete each stage. The meaning of high risk, and the chosen mechanism for funding were dependent on agency contexts, and the programs were each initiated in response to a specific observed deficiency within the agency's traditional funding methods. The phenomenon of increased designations of high risk research and variations on its prioritization, management, and evaluation is not unique to the United States; Japan, the United Kingdom, Germany, and the rest of the European Union have specifically called for more high risk research programs, and the design and implementation of these programs appears to be flavored by the national context in which they reside. The emerging national research systems of China and India are not to be left out, either. India has created funds exclusively for high risk research, and, with an action underscoring the importance that national context can have on high risk research, China's Ministry of Science and Technology has proposed a law that would allow researchers to report failure without harming their chances for future government funding - an apparent issue in a nation in which failure holds a stigma. Despite the notion that these programs are increasingly viewed as a necessary component of a national research portfolio, little attention has been given to the multitude of interpretations of high risk research and how to best support it. In this paper, we propose a series of case studies examining high risk research programs within their sectoral (public vs. private), departmental, national contexts. These case studies, to be performed primarily through review of extant literature and through interviews with program managers and others involved with science and technology funding in the various nations, will highlight the similarities and differences across the programs and the underlying contextual factors that lead to the varying definitions of high risk research.

Research Priority-setting process in China. *Li LIU, Center for Science, Technology and Society, Tsinghua University*

China has a long tradition to set research (and development) priorities which are expressed in the Medium-and-Long Term Plan for Science and Technology (for short, MLP), and the Five-Year Plan for Science and Technology (FYP), and the National Science and Technology Programmes (guojia keji jihua). The current MLP for 2006-2020 encourages indigenous innovation (Zizhu Chuangxin), to rise the gross expenditure on R&D (GERD) of the gross domestic product (GDP) to 2.5 % by 2020 from 1.30% in 2005. The report will make an overview of the research priorities, and study the priority-setting processes in China with some case studies of programs 863, 973, Mega-Science projects, Mega-Engineering projects. The paper develops a quadrant frameworks including two dimensions of strategic demand and research frontier to analysize the current research programmes, and researches the role of the scientific community, the governmental minitries, the industrial actors and the public participation in the R&D priority-setting. The research will contribute to the Actor-Network Theory and Social constructivism, with the Chinese experience.

Historical perspectives on R&D funding: Current policy issues for Japan and American experience. *Yasushi Sato, Japan Science and Technology Agency*

Recently, the overall structure of R&D funding in Japan has been changing drastically. Due to the nation's tight fiscal situation, the amount of regular funding for universities has steadily decreased. On the other hand the total amount of R&D grants has rapidly grown, as relevant governmental organizations have instituted many new grant systems. The reordering of these grant systems is now being considered to attain more efficiency. The proper design of R&D funding is clearly becoming a critical issue for science and technology policy in Japan. In reflecting on R&D funding in Japan, historical perspectives can offer some insights. Japan can learn from the historical experience of the United States, which has a long tradition of operating various grant systems. Sophisticated grant systems of the National Science Foundation (NSF) and the National Institute of Health (NIH) have been shaped through decades of intense discussion. Only by following such past discussion can one understand rationales behind the design of R&D funding systems. For example, why does the United States have multiple funding agencies instead of a single large funding agency which might allocate R&D funds more efficiently and consistently? In fact, proposals for integrating funding agencies into a single large organization have been made many times in the past, but have been discarded because benefits accruing from pluralism appeared to outweigh possible gains in efficiency. Japanese policy makers should take into account such historical discussion when they plan reordering of the current grant systems. American experience also tells us that the design of R&D funding systems can have strong impacts on the way research is conducted in universities. For example, R&D funding by NSF and NIH from the late 1950s to the 1960s critically shaped the biological disciplines in the United States. Modern approaches of molecular biology and cell biology gained force, at the cost of traditional approaches of systematics and ecology. R&D funding by NSF and NIH also affected intra-university power relations. Generally, the autonomy of university departments weakened, and disciplinary fields with generous external patrons gained power. Japanese policy makers should be well aware of such historical experience of the United States if they continue to expand grant systems in Japan. An original survey, reflecting the historical perspectives delineated above, was conducted this year. The survey shows that Japanese university researchers are deeply concerned with the changing structure of R&D funding. They have complex opinions about the positive and negative effects of the rapid growth of grant systems. They do not have strong complaints about the fairness of the systems, but want a wider distribution of R&D funding. Also, they are feeling the effects of increasing workload associated with applying for and receiving grants. Overall, the survey indicates that careful decision making is needed in this policy area so as to maintain the health of science and technology in Japan.

153. Triple-Helix (University-Industry-Government Relations) and WSI (Webometrics, Scientometrics, and Informetrics) in Asian Countries

1:15 to 2:45 pm
13: 1321

There is a burgeoning interest among academic scientists and policy-makers, in the development of TH (Triple-Helix) and WSI (Webometrics, Scientometrics, and Informetrics) research methods around the world. However, the international literature has not systematically examined TH and WSI approaches in Asia in general. Furthermore, previous literature published in international journals does not adequately address the social forces shaping TH development in Asia. In order to investigate the TH or university-industry-government (U-I-G) relations in Asia, it is essential to consider the idiosyncratic properties of national innovation system in developing and catch-up countries. Therefore, on the one hand, we can identify the national variations of U-I-G relations in this region. On the other hand, the common patterns of U-I-G relations different from that of developed countries can be explored. Moreover, as an emerging research technique of science policy and innovation studies, WSI methods have a huge potential to proliferate massive quantitative findings. For example, by measuring linkages between main actors (e.g. universities, industries and government) in national innovation system, the WSI methods enable us to

search the structure of the network existing in the system in a quantitative way. In this vein, the development in the WSI methods (e.g. visualization technique and new formula calculating linkage) is one of the important tasks for the researchers in this field. However, insight from the existing studies on the U-I-G relations in Asia as well as research methods such as WSI is not sufficiently shared to boost up the research on the TH or UIG relations in our region. Therefore, Asian researchers and policy-makers need to actively discuss and to initiate research projects addressing this issue together by adopting TH and WSI approaches. As a result, we can implement our collaborative projects identifying unique dynamics and evolution of the U-I-G relations operating in our region.

Participants:

University-industry-government relations in East Asian catch-up countries:in case of Korea, Taiwan, Thailand and Vietnam. *Ki-Seok Kwon, Korea Astronomy and Space Science Institute*; *Minho So, KAIST / Library*

In spite of a recent attention to the emergence of public science in developing countries, this topic is still relatively unexplored. Furthermore, an issue such as weak university-industry-government linkages and frail science-technology relationship in developing countries has been investigated only very recently. In particular, the interaction between universities' research, industrial innovation and government intervention in East Asian countries is far less well-explored. Against this background, in order to carry out research in a comparative way, we have selected four East Asian countries: Korea, Taiwan, Thailand and Vietnam. The first two countries have arrived at the final stage of economic catch-up, whereas the last two countries have accelerated its economy very recently. In terms of a qualitative approach, in order to explore the interaction between the three actors (i.e. universities, industries, and governments) in the context of rapid economic catch-up, we need to consider various elements influencing the linkage: the historical background of national innovation systems, policy orientation of governments, university system, industrial structure, and the activities (e.g. scientific publication, patents application etc) of the three actors. Accordingly, a set of factors influencing the relationship in the selected catch-up countries can be established as a methodological framework. In terms of a quantitative approach, in order to carry out investigation on the structural change of science and technology system in those countries, we can collect details (e.g. author, affiliation, and discipline) of scientific publications and patents applied for during the last a few decades. In particular, this study focuses on the disciplinary difference of papers and patents across the selected countries with respect to the different industrial structure. Furthermore, the longitudinal change of disciplines of papers and patents can also be investigated regarding changing domestic industrial structure. Based on the various patterns found in the analysis, we might suggest a theoretical lens or a typology different from those developed in developed countries which enables us to understand not only university-industry-government relations but also science-technology relations in East Asian catch-up countries.

Successes and Failures of an Intermediary in Triple Helix Relationships in Developing Countries: the Case of Thailand's Food Industry. *Patarapong Intarakumnerd, College of Innovation, Thammasat University*

The aim of this paper is to study the roles of intermediaries in creating and strengthening triple helix relationships and mitigating systemic failures in a developing country. The role of Thailand's Industrial Technology Assistance Program (ITAP) under National Science and Technology Development Agency in the food industry will be highlighted as a case study. ITAP has been chosen as a case study because it has been operating since 1992 and has developed technical consultant projects with more than 1000 firms since then. Therefore, it has enough track records to evaluate successes and failures. ITAP's operating model was based on the "demand driven" and "sharing responsibility" concept that each participating company must pays the expenses of the technical experts who could be from within or outside the country. ITAP pays up to 50% of the expense (but not exceed 500,000 Baht) to the company, in the form of reimbursement. The reason behind this concept is to induce the SMEs to upgrade their technological capability in manufacturing and generates their product and process innovation, and at the same time to make sure that a participating company had the real need and commitment. Recently number of local experts from Thai universities has increased considerably. ITAP has played important roles in initiating and enhancing university and industry linkages which are normally weak in Thailand. Triple Helix relationships among universities, industrial firms and ITAP were formed. Methodologically, we have taken two approaches. Firstly, we examined almost 100 projects in the food industry within the year 2007-2008 and draw general observations on factors determining successes and failures of these projects. Secondly, we selected a few success and failure cases for comparative purposes to verify our general observation and pinpoint detailed characteristics leading to failures and successes. With-in case analysis has been done as well, since we also investigated historical development steps of selected cases. Some began with failures but became successes later because they have learned the lessons well. This study has policy and management implications on triple helix practices, especially on selecting the right participating firms and university experts and successful project implementations. The capabilities of intermediaries themselves need to be enhanced, so that they can effectively functions. Government policies should pay attention on this aspect beyond standard polices addressing market failures.

The role of universities in the catching-up strategy of early entry:Insights from the development of Fuel Cells in Malaysia and Singapore. *Zeeda Fatimah Mohamad, Universiti Malaya, Malaysia*

The paper addresses the question on the extent to which universities in latecomer countries can play their role in supporting their countries' catching-up strategy of entering early in the development of new emerging technologies. The theoretical basis of this paper is based on the adaptation of new and old ideas in the literature - that is, by combining theoretical ideas from current literature about innovation systems and the role of universities in technological innovation (which includes Triple Helix literature), with a relatively older literature on early entry by Perez and Soete in 1988. Operationally, the empirical investigation was conducted by using the system of innovation approach (specifically the technological system framework and its analysis of system functions) to undertake an exploratory multiple case study on the contribution of universities in two latecomer countries, Malaysia and Singapore, in the development of fuel cells technology - an emerging technology often associated with the provision of cleaner and distributed sources of energy. The type of data employed is mainly qualitative, with some support from quantitative bibliometrics analysis. Some international and historical dimensions are also included in the analyses to allow the findings and ultimately its generalization to be contextualized appropriately within the emergence of fuel cell technology worldwide. Four key findings are highlighted in this paper in terms of the contribution of universities in the development of fuel cells as an emerging technology: (1) Universities provide greater contribution in their conventional roles; (2) Complementary roles by university and non-university actors are clearly needed in the development of system functions, even at the early stages; (3) The influence of broader policy environment (i.e. energy, industrial and environmental policies) is important in shaping universities' contribution; (4) Specific co-evolution of technological and socio-economic context of fuel cell technology within a particular country needs to be considered in understanding the extent of universities' contribution. It is argued that these findings can provide new insights to the literature, especially in providing evidence on the importance of understanding and appreciating the context of the innovation systems environment when using the role of universities to support the catching-up strategy of early entry.

The Struggles between Academic Performance and Industrial:

Collaboration: A Case Study in Taiwanese Universities. *Jou-chen Chen, Institute of Management of Technology*; *Joseph Z. Shyu, Institute of Management of Technology*

The paper was conducted content analysis and interviews to present how Taiwanese universities struggle with academic performance and industrial collaboration. Particularly, we discussed the issue in the perspective of university evaluations in Taiwan. A recent surge of university evaluation has affected the funding and capacity for Taiwanese universities. With policy and evaluation results, Taiwanese government provide additional financial support, such as the aim for Top university project, excellence in teaching and learning project, to improve universities' quality and competitiveness. On the other hand, in recent years University-Industry collaboration has given universities more funds and knowledge diffusion, but less academic freedom. According the result of the research, not only do Taiwanese universities have adapted the mechanisms of academic activities, publishing, patenting and University-Industry collaboration, but also have co-evolved with industries during economic depression. Keywords: Academic Performance, University-Industry collaboration, University evaluation

154. Nano and Society

1:15 to 2:45 pm
13: 1322

Participants:

Strategic issues in defining nanotechnology: interviews with Canadian researchers. *céline LAFONTAINE, university of Montreal*

Derived from the Greek word for "dwarf," the term "nano" currently has the same evocative force that "cyber" had in the 1990s. Judging by the keen scientific, political, financial and cultural interest in efforts to conquer the infinitely small, we appear to be witnessing the transition from cyber to nanospace, at least within the realm of our imaginary topography. Encompassing an ever-growing number of disciplines and research areas, nanotechnology seeks to transform inert or living matter at the molecular level by creating new materials whose physical, chemical and biological properties are still unknown. For instance, inflammable plastics, smart textiles and medical devices can be developed for the purpose of targeting highly specific areas of the body. Hence, references to nanotechnology or nanoscience do not allude to specific research areas, but rather to a new way of envisaging and manipulating matter—one that is affecting all fields and disciplines. Due to the major emphasis placed on it, the "nano dimension" has become the new scientific Eldorado around which international research programs are being designed. This "nano-at-all-costs" mentality, however, has raised certain issues with respect to the definition of nanotechnology itself. Attempts to define the term have been greatly complicated by the vast sums invested, the hopes raised by conquering the infinitely small and the sheer number of fields involved. Indeed, delineating the boundaries of nanotechnology involves the intersection of economic, political and ethical issues. The questions raised provide a concrete example of the inherent complexity of technical and scientific development. As the primary actors in this field, nanotechnology researchers are well aware of the related strategic issues influencing the direction of research programs. In the view of sociologist Dominique Vinck, "issues of definition are important for researchers and industrialists alike because the question of resource allocation is an underlying factor [ ]. Therefore, defining nanotechnology properly is of strategic importance to these stakeholders" (Vinck, 2009). Indeed, when researchers are asked about this point, it emerges that the contours of the multiple definitions assigned to nanotechnologies are imprecise and variable, to say the least. This presentation is based on a series of interviews with 20 Canadian nanotechnology researchers, focusing primarily on the economic, political and epistemological issues relating to the delineation of the nanotechnology field. At first glance, the lack of a clear and precise definition for a research field universally presented as a veritable scientific revolution appears more than a little paradoxical. Delving into this question a little more deeply, however, we realize that it touches on a number of key epistemological, political and economic issues. Canadian researchers are attuned to the problems associated with defining their field—but, as we shall see, they are also transforming and adapting their definitions to suit various different contexts.

Nanotechnology as ideology: towards a critical theory of 'converging technologies'. *Axel Gelfert, National University of Singapore*

Nanotechnology, if one is to believe its practitioners and proponents, has witnessed an unprecedented growth: from its alleged theoretical 'founding moment' fifty years ago, when physicist Richard Feynman argued that 'there is plenty of room at the bottom' to its major take-off in the mid- to late 1990s, research budgets have multiplied and nanotechnology has been setting the research agenda even in neighbouring disciplines such as biotechnology, information technologies, and cognitive science - hence the acronym 'NBIC' to capture the convergence of such technologies. Upon closer inspection, however, the narrative of success disintegrates quickly. Instead, a multiplicity of actors emerges - from individual scientists to funding agencies and governments - all of whom have contributed to the construction of a new 'discipline' that comprises, and puts a new gloss on, many pre-existing areas of research. (Schummer 2009) In particular, nanotechnology is as much a product of science, as it is a 're-branding exercise' connected with funding strategies and policy-making. The present paper engages this aspect of nanotechnology/NBIC with an eye towards identifying relevantly different actors and interests at all levels of the production of scientific knowledge. At the micro-level, individual research projects (along with the applications that derive from it) have been presented by scientists as exemplars for policy-making in a broader sense; at the meso-level of funding agencies, corporations, and research councils, nanotechnology has functioned as a bargaining chip for demanding increased research budgets; at the macro-level, government have turned nanotechnology into an arena of national competition and prestige. There is thus a need for a proper, multi-scalar 'framing' (Misa 2009) of the nanotechnological turn in science. In particular, the present paper focuses on nantoechnology as an ideology in the descriptive sense: whereas previous analyses of the ideological character of technology have often focused on individual artefacts (e.g. Winner 1980) and particular forms of the production of scientific knowledge, in the cases of nanotechnology the fabrication of a research field itself has been driven by ideological considerations - though, due to the diversity of actors, not a homogeneous set of such considerations. Furthermore, because 'nanotechnology' has come to be defined by a meta-perspective on science - rather than by an identifiable new domain of scientific 'content' (or in terms of scientometrics, see Leydesdorff and Zhou 2006), as it were - it has also been put instrumentalized, by scientists, as an alternative to (more 'foreign') social studies of science. The paper will also pay attention to the notion of 'convergence', which, in the case of nanotechnology, is more of a promise than a descriptive term, and which embodies many of the features of traditional views of 'scientific progress' and hence calls for a disaggregation from an STS perspective.

Government Responses to New Technologies: The Role of Interagency Coordination in Nanotechnology Investment. *Holly Jarman, SUNY Albany*

Nanotechnology development is surrounded by uncertainty: about future profitability, uses, availability, and safety. Given this uncertainty, how do governments respond? How do policymakers attempt to coordinate nanotechnology policy in relation to other issues such as public health and education? To what extent are they successful in creating a stable and integrated policy environment which maximizes growth in these industries while minimizing risks? Many countries, as well as individual scholars, gauge the leaders and laggards in the nanotechnology

race by measuring their comparative success at pushing public and private funding into this sector, the number of academic papers published addressing nanotech, or numbers of patents produced. We propose that a qualitative approach to evaluating nanotech policy can compliment these efforts. Understanding how governments coordinate nanotechnology policy- which potential nanotech applications are emphasized by governments, the extent to which governments integrate economic and public health concerns, and how policymakers frame the relationship between society and nanotechnology- gives us important insights which can help us to predict how a nanoeconomy might evolve in the future. Taking a comparative approach which analyses the political and legal development of nanotech policy, we focus our study on several of the major actors attempting to reap the economic benefits of nanotechnology development: China, the European Union, Japan, Korea, and the United States. We find that nanotech policy develops along a substantially path dependent trajectory. In each country we study, the nanotechnology applications emphasized by governments are those with substantial existing infrastructure and investment. This raises several important questions concerning the practicalities of 'innovation' and sheds light on how countries adopt global market specializations in practice.

Bridging Science and Innovation? A case study of U.S. National Nanotechnology Initiative. *Yasuyuki Motoyama, University of California, Santa Barbara*; *Richard Appelbaum, University of California, Santa Barbara*; *Rachel Parker, University of California, Santa Barbara*

A case of the National Nanotechnology Initiative reveals that the U.S. government has creatively integrated the science and technology policy and the industrial policy, traditionally two different streams of policies. The federal government justified the Initiative by calling for the scientific need of technology for industrial competitiveness. We find evidence that this program was initiated and drafted by a small handful number of policy makers in Washington. Moreover, the role of government extends to strategically select technology of the next generation and to arrange large-scale public investment, now funding over $1.5 billion and extending to thirteen federal agencies. This sharply contrasts with the conventional understanding in political economy, which argues that the role of U.S. government is limited to set the regulatory rules and provide infrastructure. We will analyze this from the archives of policy documents. At the same time, despite its intention to strengthen the industrial competitiveness and after eight years since the inception, the bulk of the federal government fund continues to channel into universities and government labs and little into the private sector. Whether this goal will be achieved without more direct government focus on commercialization remains uncertain.

155. Future Colleagues and Future Directions in the Social Studies of Science and Technology

1:15 to 2:45 pm
13: 1331

As any cultural institution, the social sciences undergo trends in ideas and topics. The generations before us impart their interests and opinions alongside wisdom and knowledge. A student studying science and technology today cannot escape professors' enthusiasm for the posthuman, postphenomenological, ontology, invisible/visible, structure/agency, hybridity, alterity, just to name a few. But as the professors, professionals, and colleagues of tomorrow, where will our interests take us? What is the future of 4S? This panel provides a venue for graduate students and junior faculty from round the globe to gather and discuss the research of tomorrow. Panelists discuss how their current work extends, questions, and reworks current models in science and technology studies, and introduces the work of the field into new domains. How can we use the insights of STS to expand practices of design, research, and policy? What sort of models are most appropriate for examining the processes of science, both past and present? How can we account for interactions between fields and actors (both human and nonhuman) either ignored or actively denied? How might we rethink our own practices of research and writing based on the implications of our theoretical approaches? What should the STS classroom of the future look like? Where does STS "belong"? How can STS respond to and actively participate in anticipating and finding solutions for many of the looming national and global crises? How serious must we be about our research and writing practices? Where and how does art, play, design, and innovation fit within the field of STS? How can we build more collaborative partnerships in the future? These are just some of the tantalizing questions this panel seeks to explore. We promise no answers, but seek to inspire, build community, and provoke a sense of adventure. In order to foster a spirited dialogue, the panel will assume the format of a roundtable discussion rather than a traditional paper-reading format. Panel presentations will be short, and the majority of the time will be devoted to discussion between panelists, discussants, and the audience. Longer versions of the presentations will be pre-circulated to anyone interested in engaging more deeply in the conversation. All are welcome to attend and join the dialogue.

Participants:

How Anthropology Can Contribute to Multi-Disciplinary Gerontological Research Teams. *Ender Ricart, University of Chicago*

Aging has become a subject of national and international concern. In 2002 the United Nations held the second World Assembly on Aging in which the future implications of mass scale aging on the economic, social, political, and personal were taken into consideration. While the United Nation's characterizes 'aging' as a pressing universal social issue, it is equally critical to recognize that how 'aging' is perceived and approached varies with each region's social, cultural, and historical specificities. These differences impact: 1) Local gerontological research design and method 2) the constructions of aging and 3) the success of international collaboration. With the largest demographic considered to be 'silvering', Japan stands to be impacted by the effects of an aging population more than any other nation. In the last two decades Japan has witnessed a dramatic decline in birth rates, a rise in life expectancy, and the impending retirement of the baby-boomers. Given the dramatic statistical projections for their aging population, Japan's government has been pushing for research and development in the area of gerontology and implementing social policies designed to secure the future well-being of aging individuals, society, and nation. With other aging nations looking on, Japan strives to become a model of how to age gracefully. Gerontological research teams have recognized the necessity of multidisciplinary and international collaboration to successful research and policy planning, and yet, despite the fact that the anthropology of gerontology is well establish, few anthropologists have been active on gerontological research teams to aid in collaborative research efforts. Based on my summer research experience at 'Tokyo Metropolitan Institute of Gerontology' in Tokyo Japan, my paper will explore: 1) cultural gerontological research approaches to aging and the aged, 2) those areas where anthropology can positively collaborate with a multi-disciplinary gerontology team to further contribute to the gerontological goal of improved well-being for the elderly, their caregivers, and society, and 3) how anthropologists can aid in national and international research cooperation and social policy planning by accounting for local differences.

The Interwoven Relationships between Theory and Practice in Science: The Development of Temperature and Thermometers by Active Interaction between Science Research Traditions. *Hsin-Yi Wang, Institute of STS at National Yang-Ming University, Taiwan*

This presentation is about the issue of how science research traditions develop and interact with each other. Based on my past education in the graduate school of physics and personal interest in history and philosophy of physics, I tried to borrow Feyerabend's idea of active interactions but use it in a different way to interpret the development of the concept of temperature and thermometers. The most challenge of this argument is the fruits of science research traditions, (including the concepts, instruments, common units etc), must be shaped by active interactions between all science research traditions involved,

whether it is a theory research tradition or a practice research tradition. Even more, both of them always come together to a Science fruit and impact each other by working on this sharing mind or material space. Therefore, any model that only mentions one side would fail to reveal the real path of science going. We would test the hypothesis above through observing the historical progresses of the concept of absolute zero, and occurrences of the types of present thermometers, like air thermometers, electrical thermometers and radiation pyrometers. From these two examples, we would see there was much communication between different science research traditions in the past. This would give impetus to produce new shaped fruits, (New definitions of absolute zero, New types of thermometers, and the New presentations of common units) in order to make the process of communication more smooth. In other words, these shaped fruits bridged science research traditions, and would make the active interactions occur more often and easier. Consequently, they would also reflect the change of active interactions between different science research traditions. Accordingly, we could discuss the quality of active interactions by examining the variations of these objects. In this part, we also will take two examples as our primary examples, which are the process of the thermocouple attached to the air thermometer in the early 20th century, and the remains of the concept and units of Calorie and Temperature in the presence. We would see there were the following phenomena in their evolutions, namely: "mutual benefits from cooperation," "locality of replacement", which resulted from the interwoven and complicated relationships of the network of science research traditions. And this will help us to clarify the misunderstanding of 'scientific revolution'. By investigating the examples above through the viewpoint of active interactions, we would find that some shaped fruits might make voices of their related research traditions louder (or disappear) in some field if there were more (or no) active interactions which passed them. Therefore, we will see the further details about how and why so many 'definitions of temperature' and 'thermometers' present themselves this way in the scientific field or our daily life. Through this discussion above, we will construct a new model to describe how science research traditions develop. And I will show the prospects of this new model of getting into a conversation with the classical STS theory, like Kuhn's viewpoint, SCOT or ANT.

Teaching "STS in Practice": Lessons from "Becoming Animal, Technical and Environmental: A Practical Course in Disruptive Art and Design.". *Sara Wylie, Massachusetts Institute of Technology*

his talk explores the concept of "STS in Practice" by describing and presenting work from a novel course developed at Rhode Island School of Design: "Becoming Animal, Technical and Environmental: A Practical Course in Disruptive Art and Design." I developed the course in the Spring of 2010 to explore alternative mediums of STS work and practice by challenging the students to expand upon, implement and critique ideas from STS in the mediums of art and design. Though many contemporary bio-artists and technology designers are inspired by insights from STS, there is currently no field of STS "in practice". This class took a step toward changing that. All artifacts and social systems have politics. This course taught methods and theory drawn from STS to explore the politics of artifacts and to build artifacts with different politics. Students examined and sought to intervene in the relationships formed through science and technology between humans and animals, humans and machines, and between humans and their environments. This was achieved by studying how science and technology came to play such important roles in structuring these relationships through industrialization. In parallel we examined contemporary problems of industrialization such as climate change and endocrine disruption as scientific and social problems related to our processes of knowledge generation and technology production. We explored and offered answers to the questions "Can we build different kinds of relationships to our environments, machines, and non-human others through changing our design and knowledge generating practices? and "What roles can Art and Design play in that change?" I present this course and its products to open up discussion on developing novel approaches to STS research, to share the ideas we generated and as a tool kit for other STS scholars pursuing STS in practice.

Encounters with Ghosts and the Ethics of our Writing Body-Machines. *Sarah Rebolloso McCullough, University of California - Davis*

I believe we all collaborate with unacknowledged "ghost writers," partners to our successes (or failures) as STS scholars. To think critically about these fellow composers could significantly enhance our own writing practice and products, while also exercising a more ethical and pleasurable mode of writing. These ghost writers are the actants comprising our writing practice. More than just representation, writing is an embodied practice enacted through encounters with laptops, desks, chairs, stimulants, snacks, people, and a plethora of other stuff. For this panel, I consider the practice of writing as an encounter that not only produces knowledge, but also enacts body-machines. We are made through interactions with others, both human and nonhuman, and these relationships craft reality. In recent years, STS scholars question not just how knowledge is made, but also how reality emerges. This turn to the ontological focuses on how encounters and practices produce both objects and subjects that are multiple in their material and semiotic dimensions. Not only is knowledge embodied in practice, but bodies and objects are remade in this process as well. Let us take our writing body-machines seriously. To think about how we might do this, I interview, chat, video-record, and write alongside fellow budding STS scholars to notice how we write. A number of things emerge. We notice that writing is not a solitary process, and that our bodies are highly implicated in this supposedly cerebral event. We begin to acknowledge the relationships situated in writing and the stuff produced in this process other than written text—sore wrists, a broken keyboard, butt grooves in the seat of the chair. These mundanities matter greatly because they provide the entry point through which to re-enact our body-machines and create more ethical relationships of writing. This is an ethic of care for self through care for companion species—a mode of writing that moves out of relationships always in process. We are already writing with others and producing more than just text, but our co-writers and other products are often mere traces, or ghosts. We need to make our ghost-writers full participants in order to enact an ethics of writing that accounts for language, bodies, and machines as fully enmeshed.

Mischievous Tactics, Contamen and "Sound Design": How Ethnographic Circuit Bending Configures Perceptible Noise. *Jessica Caporusso, York University*

In the resonant milieus through which sounds are dismantled, reassembled and articulated, "dirty audio" may be considered "contaminated" bits of sound—that which has not been polished, perfected, or more or less, "cleaned up". Following from the notion of sonic artefacts—perceived anomalies in digitized audio signals—my research seeks to explore the manufacture of sounds and the pristine/polluted environments from which they are crafted. Here, seemingly "clean" environments are constructed to distance crude sound from polished product, and leads to the adage: what is often heard is never all that it seems. It is in these small bits of harmonic dissonance—inadvertently created through the production of desired aesthetics—that often belie more than their intended meanings. In this session, I propose a different sort of engagement between researcher and her field site, one that addresses camaraderie between sound and study. This exercise in learning to perceive usually imperceptible moments of ethnographic encounter through contaminated sounds has eluded previous studies on audio engineering. While previous scholarly research has leant itself to analyzing how audio engineering practices are acquired through pedagogical instruction and training in sound production, this divergent ethnographic strategy focuses on investigating how seemingly

innocuous "background" noises are integrated into practitioners' crafts, and by extension, their socialities. Using these questionably shaky, grey areas as departure, this project seeks to revel in the messiness of contaminated sound, and to extend the call to perceive those "noises" that are often left unheard. Through this research, I intend to use strategies of audio engineering as playful methodology for ethnographic research. This mischievous tactic embraces the ethical, epistemological and methodological messiness involved in my project, using my positionality as researcher to "play" through research with the theoretical and methodological "toys" of audio engineering. I endeavour to explore the future of ethnographic field/work by attuning to lively infoldings of play and practice and entanglements of these relationships with sound production. This research follows from fieldwork based in the Greater Toronto Area's sound recording communities, and explores the entangled engagements between audio engineers and their "playthings".

Discussants:

So Yeon Leem, Seoul National University
Adam Baim, University of Chicago

156. Making bodies things: anatomical models and specimens in circulation

1:15 to 2:45 pm
5: 511

As anatomy became increasingly central in the nineteenth-century to practice and training in the biomedical sciences, new strategies emerged for the acquisition, preservation and circulation of human and other animal remains. These took place as part of an increasingly globalised scientific endeavour, which relied on the establishment of extensive exchange networks. These networks both fed and responded to the demand for standardised anatomical models and human specimens. This period saw the creation of vast collections of human materials and models in university and museum contexts. These became sites where the range of human pathology and difference was analysed, quantified and displayed. This session will examine how the production and distribution of anatomical specimens and models reflected and informed scientific and medical practice and training. It takes case studies of individual institutions and producers and explores how they became integrated into global networks. Bringing together historical, anthropological and museological perspectives, it locates anatomical models as commodities embedded in complex networks of influence, exchange and expertise. It considers how models were acquired, produced and valued in teaching and research contexts and examines their role in the standardisation and increasing specialisation of anatomical teaching. Papers will explore the development of the anatomical museums at representative sites within the global anatomical enterprise, at colonial Sydney and the Karolinska Institute in Stockholm; the marketing strategies of model makers; the transmission of new ways of representing and displaying human anatomy and the transnational and trans-colonial features of the exchange networks established between anatomical schools and museums. In addition, the session will explore how the role of anatomical models in the construction and dissemination of scientific categories and hierarchies, whether between the normal and pathological, or between human populations. Its focus will be on communities and networks of production, evaluation and consumption.

Participants:

Science in Three Dimensions: The Anatomy Museum at the Karolinska Institute, Stockholm, 1830 - 1860. *Eva Åhrén, Uppsala University / Smithsonian Institution*

This paper deals with the production, acquisition, and use of anatomical models and specimens at the Karolinska Institute (KI) in Stockholm, during Anders Retzius's (1796 - 1860) time as head of the anatomy department and director of the Institute. KI was a node in the global network of scientists dealing with body parts, and Retzius was its main actor. Established in 1810 as a school for surgeons, KI rapidly became Sweden's most modern medical school, in competition with the medical faculties at the universities of Uppsala and Lund where the traditional natural philosophy approach long held sway. KI became renowned for using scientific methods and practices, and for its eminent teachers, like chemist J.J. Berzelius. The anatomy department attracted students because of its hands-on dissecting classes and up-to-date pedagogy. Retzius was an avid dissector of human and animal cadavers, a prolific researcher and an enthusiastic developer of teaching methods. Like other Swedish scientists, he went on journeys around Europe, attending meetings and studying museums and university departments. Archival materials and letters reveal his influences and the measures he took to shape and build KI's anatomy collections from 1830 onward. Retzius exercised detailed control over the material aspects of the museum, setting up work-stations with microscopes and other advanced equipment, ordering glassware and chemicals, designing show-cases etc. Inspired by Pestalozzi's pedagogy of observation, he made sophisticated use of media in the classroom, combining lectures with charts, blackboard drawings, models, and specially produced specimens. Over the years, Retzius built up an extensive international network of institutional, professional and personal affiliations. An early promoter of comparative anatomy, Retzius became a close friend and collaborator of Johannes Müller, professor of anatomy and physiology in Berlin. From the 1840s on, Retzius focused on physical anthropology and the collection of racial specimens. American anatomist Samuel Morton was one of the colleagues with whom he exchanged letters, specimens, and literature. Specimens also came to Sweden via explorers, diplomats, emigrants and seafarers. The skulls of indigenous Sami people, obtained from doctors and priests in northern Sweden and from Scandinavian colleagues, were prized items for trading with anatomists in other countries. The anatomy museum at KI was not only, or even foremost, an educational resource. Using KI as a case study, I will argue that models and specimens were important three-dimensional media of scientific communication. Nineteenth-century anatomy museums were central sites for the production of knowledge, before the rise of the laboratory. Making specimens and models was a way of doing research. Researchers in anatomy (and related fields: pathology, histology, embryology) developed sophisticated methods of dissecting, coloring and preserving specimens. Specimens had the status of proof, not least when used as the basis for article illustrations. The museums functioned as archives of research materials and libraries of scientific studies. They were vital nodes in networks of scientific exchange and played a crucial role in the specialization and institution-building of medical science.

Globalizing Bodies: The Marketing Strategies of Nineteenth-Century Anatomical Model Makers in Comparative Perspective. *Anna Maerker, Oxford Brookes*

Around 1820, the French doctor Louis Auzoux developed an extraordinary new tool for medical instruction: a life-sized anatomical model which allowed for hands-on interaction and "dissection" into pieces - the forerunner of today's classroom models in plastic. Unlike the wax models of the seventeenth and eighteenth centuries, beautiful but fragile, Auzoux's teaching aids were made from a paper paste, rendering the artificial bodies robust, detachable and mobile. Auzoux gained the support of the French government and the academies of medicine and science to establish a commercial modelling enterprise. He initiated factory production in his home village, and set up shop in Paris, around the corner from the famous medical school where he had received his doctorate. The enterprise became a global commercial success, contributing to the world-wide dissemination of Western images of the body. The Brazilian emperor made Auzoux a knight of the Order of the Rose; the tsar and the pope sent laudatory letters; American Ivy League universities prided themselves in their Auzoux models; a Japanese franchise was established in the 1880s. Today, Auzoux models can still be found in teaching collections around the world. They established the genre of brightly coloured detachable anatomical models which have become ubiquitous in education at all levels, and which shape our understanding of the human body to the present day. My project aims to reconstruct the history of this influential enterprise in its local and global context, situating the production and use of the models in the medical, political, and popular culture of their time. Analytically, the

project focuses on two central issues, the commercial nature of the Auzoux enterprise and the global circulation of the models. The project analyses the many ways in which the artificial anatomies circulated - with Auzoux's sales representatives, travelling to places like Russia and Egypt, with philanthropists and government officials who sent models to the colonies in India and Sudan, and with itinerant public lecturers like Frederick Hollick who employed Auzoux models in his controversial lectures on reproduction for lay audiences in the US. For this paper, I propose a comparative perspective on Auzoux's approach to marketing. Using historical maps, catalogues, and photographs I reconstruct Auzoux's neighbourhood in Rue de l'école de médecine and its range of shops, competing for customers among the teachers and students at the medical faculty. How did Auzoux's strategies compare to those of other Parisian entrepreneurs catering to both a local and an international market, such as surgical instrument-maker Charrière and the Deyrolle company, producers of teaching materials? In particular, I investigate how Auzoux and some of his contemporaries, such as the "Napoleon of the prospectus" publisher Migne, made use of new products, infrastructures and technologies such as cheap mass-printing. This research aims to illuminate how Auzoux and his competitors contributed to a changing culture of medical consumerism, and to analyse the relationship between local and global transmission.

A veritable cornucopia: anatomical exchange in the British Empire. *Ross Jones, University of Sydney*; *Lisa O'Sullivan, Science Museum London, University of Sydney*

A veritable cornucopia of mammalian, avian and human material travelled across the world from Australia in the form of exchange gifts and research material in the late nineteenth and early twentieth century British Empire. Chief amongst the agents involved in this intellectual commerce were anatomists in Australian universities or expatriate Australians in the United Kingdom. This paper explores the extent to which this exchange involved the diffusion of antipodeain attitudes to race into the European millieu through the examination of some case studies. The Englishman Frederic Wood Jones spent two decades collecting Australian anatomical material and sending it to the British Musem, major American museums and the Royal College of Surgeons of England. Grafton Elliot Smith, on the other hand, was an Australian who migrated to the United Kingdom and became a leading anatomist and physical anthropologist of his era. Both Wood Jones and Elliot Smith were intimately connected professionally and intellectually and both helped to transform European race science. I will examine the extent to which their Australian connections contributed to contemporary theories of race.

Chair:

Lisa O'Sullivan, Science Museum London, University of Sydney

Discussant:

Michael Sappol, History of Medicine Division at National Library of Medicine

157. Communication: Devices and Users II

1:15 to 2:45 pm
5: 512

Participants:

On "Benefit" of Making Visible: Visualization in Task Management. *Shinichiro Sakai, Rikkyo University, Graduate School of Sociology*; *Norihisa Awamura, Graduate School of Library and Information Science, Keio University*; *Nozomi Ikeya, Palo Alto Research Center*

Task management is crucial in any work environment today. Tools, instruments and/or policies have been suggested to aid sharing tasks and coordinating. Our aim in this paper is to show the importance of paying attention to not only the technical way of visualizing task status and action items, one of the key concepts in task management but also how the members see the visualization, and what practical meaning visualization has for members. We conducted a fieldwork study with a group of IT product designers. When we started the fieldwork, the group leader was struggling with task management. The leader had hard time keeping to deadline for delivery and preventing omissions. The leader was initially trying to carry out task management by listing the group's task status and by organizing task management meetings every week with his subordinates. Group members, on the other hand, were individually keeping track of their action items, but never as a group. At this point there was not much visualization embedded in their work. When we presented our findings to the group, we were requested to reconsider their way of task management. We suggested implementing a large collective board, where individuals put in writing their action items of the day as an instrument in order to facilitate task sharing with each other at daily meetings. However, there was a conflict on creating a balance on visualization. In the course of trial, the group leader wished and insisted in having comprehensive visualization on group's task status. The members, on the other hand, did not see merit in a fully visualized list of tasks. Having long list of task status did not help them coordinate task management. It was rather a tool for management. We decided to reorganise our set of design with incorporating having the small boards individually, an idea originally proposed by one of the members. Individuals were to present the plan of the day with requests and suggestions made as to how the work would be coordinated; the group leader would be responsible for reassignment, rescheduling, and so forth. Since then we observed several changes. The first was that members started coordinating amongst themselves. Another was that members wanted to see what was related to task reassignment, rescheduling or even declining tasks. These changes came about as a result of the process involved reinventing and integrating ideas on visualization. In our fieldwork we did not just provide a tool for visualization. We had co-designed, with the group members, a method of practice for visualization and how they could benefit from its application on task management. The findings we have learned indicated the key to success of introducing and implementing change in practice lies in assuring the benefit of practice for the all level of practitioners.

Social Impact of Machine Translation as Communication Tool. *Mika Yasuoka, Kyoto University*

Machine translation technology has adapted to the daily life due to increasing easy access to free online machine translation system. In spite of its demands in use in a wide variety of internationalized field nowadays such as business, public service, education, medical service, and NPO activities, social impact of machine translation in use have largely underestimated and its consequences have not been discussed seriously. Dangers in naïve overreliance on machine translation without decent knowledge of the system functions or local adaptability have already been reported, some of which could even violate national dignity and identity. For example, a book written by a Danish elite soldier in 2009 was translated into Arabic by machine translation without any human reviews and disseminated to the Arabic world. The accidental and unintended translation of the book condemned as deplorable and extremely dangerous. It is expected that the use of machine translation in society is accelerated in order to meet the expectations of the current internationalized society. Due to this, understanding and investigating impact of machine translation in practice with available system and foreseeing the future with multilingual technologies would contribute coming information society. For example, the multilingual translation support framework, the Language Grid developed by the National Institute of information and communications Technology (NICT) have high possibilities to investigate social impacts of machine translation as communication support tool. Not only with computational multilingual support but also with improved accessibility and usability to existing language resources such as machine translations and domain specific dictionaries, the Language Grid lowers the barrier of testing impacts of multilingual

communication in wide varieties of social activities. The functional uniqueness of the Language Grid such as creation of translation paths by combining language resources, creation of local and community specific dictionaries, and quality validation through back-translation are expected to contribute in improving machine translation results, which pose possible solutions under current ambivalent balance between high needs of multilingual supports and limitations of machine translation. We conducted empirical investigations on multilingual communication using the Language Grid among international communities across geographical boundaries. Based on the analysis of our multilingual communication cases, we discuss what machine translation can provide to the multilingual societies. We argue machine translation can provide both benefits and losses, some of which can easily overlooked. Our empirical investigations reviled that successful communication in our cases were made with the help of machine translations in spite of the limits of current machine translation technologies. Users were evoked creative mind to align technologies, in other word technology adaptation, and compromised with what the machine translation could provide. At the same time, confusions were still observed caused by information deprivation that machine translation eventually contributed. The intensive use of machine translation and related information technologies in society has recently accelerated. It is important to pay more attentions on consequences of machine translation in the use of social interactions. All the more, understanding the impact of machine translation on multilingual societies will be crucial and beneficial to the STS community.

Infrastructures of Self-Presentation: the sociotechnical performance of digital identity. *Jed R. Brubaker, University of California - Irvine*

Digital identities are a collaboration between users and technology. Increasingly, computers speak on our behalf, instantiating identities stored in databases, and technologically producing profiles through servers. The representational work performed by our digital proxies is best demonstrated through social sites such as Facebook where users are ostensibly in control of the shape and behavior of their self-presentation. These identities, however, are constrained by the classification systems utilized and produced by software. This paper considers digital identities technologies relative to our social and institutional infrastructures. Drawing from Star's theory of infrastructure and Bowker's work on databases and data architecture, I utilize ethnographic methods and systems analysis to compare the distinct forms of digital identity seen on Facebook and craigslist Missed Connections. On Facebook, user profiles are structured around a central "User ID" that ensures a legible identity across various systems. Users develop robust identities inside of a structured profile system, utilizing a variety of categories and classification systems decidedly embedded into the software. Meanwhile, users of craigslist Missed Connections are given little of the structure seen on Facebook. Instead, users establish a kind of temporary social network, describing themselves and others, the relationships they share, and the social spaces in which those relationships existed. Because there is no profile system to structure these digital identities, users turn to sources of identification that persist beyond the lifespan of their post, often from their physical world. Facebook and craigslist Missed Connections give us insight into the ways in which individuals negotiate various infrastructures of self-presentation in mediated environments. Most digital identity architectures are built around essentialized conceptions of identity that, stored as a set of categories and classifications in a database, can become rigid and unusable. Approaching identities from the perspective of the work they perform, I argue for a reexamination of digital identity as a functional unit of larger infrastructures, and articulate the challenges associated with persisting something as dynamic as identity.

158. Community Based Sustainable Innovations: Networks, Platforms and Agency

1:15 to 2:45 pm
5: 513

The purpose of this session is to identify the dynamics of innovation processes in the field of sustainable energy. As COP15 at Copenhagen showed, amidst the difficulty of achieving consensus at the level of global policy making, local sustainable energy planning and implementation is active not only in the developed countries but also in emerging economies and developing countries. One of the significant research topics in science and technology studies is thus to elucidate the dynamics of local sustainable energy practices, and better understand the conditions that make for successful socio-technical innovations. In this session we explore the dynamics in terms of green knowledge-making, networking , platforms and agency. Thanks to the rapid development of the internet and information technology, various networks aiming at promoting local sustainable energy have grown in the last decade. These networks have provided various useful resouces for the effective planning and implementation of local sustainable energy. However, it is still unclear how to evaluate the role and effectiveness of sustainable energy networks. As most of the local pioneer practices occur in a sporadic or ad hoc way, regional platforms, which would aggregate potential followers and hatch new ideas, can play a significant role in sustainable energy policy making and business development. However, different kinds of composition, and different degrees of openness and effectiveness of such platforms have not been well analysed so far. In the actual process of local sustainable energy, the various actors' actions and interactions can be considered one of the most influential factors. Collaboration among politicians and policy-makers, businesses, financial instiutions, academics, NGO/NPOs and citizens requires a better understanding of each other, and a more "hybrid" competence or imagination that can enable new combination of different forms of expertise and knowledge. We will consider these points with empirical data taken from studies and reflections of actual practices, by organizers and participatory observers, and will discuss future direction of research into local sustainable energy in relation to science and technology studies. This session will contribute to STS by providing some examples of emerging green knowledge making, which we distinguish from traditional academic science, on the one hand, and more commercial, or transdicplinary technoscience, on the other.

Participants:

Sustainable Energy as Green Knowledge. *LEONARDAS RINKEVICIUS, KAUNAS UNIVERSITY OF TECHNOLOGY*; *Andrew Jamison, Aalborg University*

As the making of environmental scientific and technological innovations - or what I have characterized in my writings as "green knowledge" - has been transformed over the past three decades into an amorphous quest for sustainable development, a tension has emerged between a dominant, market-oriented form of knowledge-making, "green business", and more community-oriented, or "grass-roots" forms of knowledge-making. While many, if not most of those concerned with environmental problems, and, more recently, climate change, have sought, ever more actively, to orient their knowledge making toward the commercial marketplace, others have come to interpret sustainable development in more critical terms, and sought to orient their activities to the needs and concerns of local communities. The purpose of this paper is to provide a historical and conceptual framework for the session as a whole, tracing the dialectics of green innovation from the 1970s to the present. The paper contrasts the different forms of knowledge-making that have developed in terms of their cognitive praxis, drawing on concepts that have been presented in the author's book Social Movements. A Cognitive Approach (Polity 1991), written with Ron Eyerman and The Making of Green Knowledge (Cambridge 2001). Using examples from the contending worlds of green business and community-based knowledge making in relation to sustainable energy development in Denmark, the paper will identify the different types of intellectual and technical activity that are at work, the meanings, types of agency, and not least the different contextual situations that are involved in the different efforts to make energy production sustainable.

Sustainable Energy Networks and Knowledge Flows. *Shota Furuya, Aalborg University*

Thanks to the rapid development of the internet and information technology, various networks aiming at promoting local sustainable energy have grown in the last decade. These networks have provided various useful resouces for the effective planning and implementation of local sustainable energy. However, it is still unclear how to evaluate the role and effectiveness of sustainable energy networks. This paper examines various types of sustainable energy networks with the perspective of 'policy netwrok.' Policy network provides insights into the dynamics of resource exchange among actors and makes explicit institutionalization process of sustainable energy. However, as policy network mainly supposes the state and other policy domains' resource dependence, it needs to be reconsidered with the concepts such as 'open source' and 'knowledge flows' in terms of multi-stakeholder engagement. Empirical analyses will be applied to global renewable energy policy netowrk (e.g. REN21), regional sustainable energy network (e.g. EU Covenant of Mayors) and local renewable energy network (e.g. ICLEI Local Renewables.)

Strategic Platform Building for Sustainable Energy. *tetsunari IIDA, Institute for Sustainable Energy Policies (ISEP)*

As most of the local pioneer practices occur in a sporadic or ad hoc way, regional platforms, which would aggregate potential followers and hatch new ideas, can play a significant role in sustainable energy policy making and business development. However, different kinds of composition, and different degrees of openness and effectiveness of such platforms have not been well analysed so far. This paper will show some examples in Japan initiated by strategic cooperation of NGOs, local governments, businesses, financial institutions and citizen.

Articulating Agency in Sustainable Energy. *Yasushi Maruyama, Nagoya University*

In the actual process of local sustainable energy, the various actors' actions and interactions can be considered one of the most influential factors. Collaboration among politicians and policy-makers, businesses, financial instiutions, academics, NGO/NPOs and citizens requires a better understanding of each other, and a more "hybrid" competence or imagination that can enable new combination of different forms of expertise and knowledge. In this part, we discuss how agents or actors with required knowledge and mind can be developed. Based on the experiment of "on the project training" of the undergraduate education programm, it will be made clear how the required skill, e.g. "translation", can be developed.

159. Warcraft and Virtual Worlds

1:15 to 2:45 pm
5: 514

Participants:

Ensidiagate and The Treacherous Code. *Kristine Ask, NTNU*

Lessig's (2000) «Code is law» has become a slogan to address the interchangeable relationship between regulation and code. In the case of virtual worlds, such ideas as «Code is law» becomes quite literal as code is what creates the space players move in and the rules that govern it. The interaction with rules is universally agreed upon as one of the central features of games, but playing is not simply adhering to a set of rules, it's tracing their presence and testing their boundaries. In such, playing computer games centres around the understanding and construction of code and this explicit interaction with the code makes games a suiting subject for STS. Massive Multiplayer Online Roleplaying Games (MMORPGs) and other Virtual Worlds have become an increasingly popular theme within the interdisciplinary field of Game Studies and its bridges to STS are growing (see f.ex Taylor 2009). While Game Studies aim to give theories universal for all games, the interrelationship between the rules and the code brings up unique conflicts and possibilities. After all, the code dictate the rules, but discrepancies can occur between the rules of the game and the rules of the code, as code turns out to be far from hard or absolute. Further more, the code can hold opposing meanings, as well as hidden ones creating a tension between rules, code and practice in games. Haraway's cyborg thought us how these hybrids can be both treacherous and unfaithful (Haraway 1991), an aspect I wish to bring forth in this paper. To explore this feature I will present a case study from the game World of Warcraft. The event took place in january 2010 when only a few hours after the group of elite players known as Ensidia reported themselves as the first in the world to defeat the final challenge the game, the players had their accounts temporarily suspended for cheating and the achievement struck from their avatars records. Ensidia claiming their innocence, saying they did adhere to the rules - the story spread like wildfire in the playercommunity, with one prominent blogger coined it «Ensidiagate». While the key point for many discussant was whether Ensidia was guilty or not of this infraction, I wish to turn the attention to what gave room for this event; the unruly code. Not only did the code betray the designers when it did not perform according to it's plan, it also betrayed Ensidia's players when it's fluidity gave room for what would later be labelled an exploit. Was is lack of sportsmanship? Was it faulty design? Or is the code perhaps deceiving them both, displaying the trickster within? Haraway, Donna (1991): Simians, Cyborgs, and Women. The Reinvention of Nature. Free Association Books. London Lessig, Lawrence. 2000. Code : and other laws of cyberspace. [New York, N.Y.]: Basic Books. Taylor, T. L. 2009. The Assemblage of Play. Games and Culture 4, no. 4

Creativity: The Goose That Laid the Golden Egg. *Linda Garcia, Georgetown University; Garrison LeMasters, Georgetown University, CCT Program*

Since the late 1950s, sociologists, psychologists, psychologists and neuroscientists alike have begun to pay attention to the subject of creativity (Weiner 2000). Some have gone so far as to propose that creativity will one day be the driving force of the American economy, as well as the primary means of promoting a country's competitive advantage (Pink, 2005). Others have argued that the growth of the creative sector of the global economy will have a transformative impact on society as we know it, giving rise to a new social class that crosses national boundaries (Florida, 2002). This is not the first time that the dynamic forces of capitalism have spurred creativity onward. The secularism associated with the Enlightenment, for example, freed creators from the bonds of the Church, allowing them to become artists and inventors in their own rights, earning reputations and selling their creations in the market place (Weiner, 2000). This favorable attitude towards creativity and innovation was nowhere more pronounced than in the early years of the United States, where creativity and invention were not only deemed critical to a nation short on man-power but also imbued with mystical overtones (Smith, Merrit Roe, and Leo Marx, ed. 1998; Hughes, 2005). Thus the Founding Fathers stipulated in the Constitution that Congress was to protect intellectual property rights. As the rich cultural history of the US attests, creativity thrived under this capitalist regime. So much so, in fact, that today the outputs of the creative sector constitutes a major portion of the national economy (Florida 2002). This paper suggests, however, that the relationship of the market to creativity is about to change. In particular, we suggest that with the advent of user-centric digital culture, the free-market mechanisms that fostered innovation and creativity will instead constrict them. One might say that the forces of the market may kill the goose that has laid the golden egg! To pursue this line of argument, this paper will consider two online virtual worlds. Second Life is a popular virtual world built and maintained by Linden Lab, commonly admired for its IP model: Residents of the world who purchase virtual bricks from Linden Lab are free to duplicate and distribute the complex structures they create, retaining the rights to their virtual innovation. We contrast the homogeneity of artifacts created and sold by Residents working within the confines of the market with the innovation achieved early in Second Life's history. In the World of Warcraft, a capital-style market provides the backbone to the game. Players' adventures are rewarded with virtual gold, which is in turn is used to buy more sophisticated virtual

weaponry and armor. In-game Auction Houses provide players with sanctioned sites of trade. At the same time, Guilds are player-administered social organizations that exceed the bounds of the game client, existing in-game, on the internet, and even in the real world. Bound by a spirit of collective well-being and shared interest, members creatively circumvent the determinism of the in-game market by sharing their wealth.

160. Innovations, experimentation and society: perspectives from South Asia

1:15 to 2:45 pm
5: 515

Organisers: Yulia Egorova and Salla Sariola (Durham University) Discussants: Kaushik Sunder Rajan (University of California at Irvine, ksunderr@uci.edu) and Aditya Bharadwaj (Edinburgh University, adi.bharadwaj@ed.ac.uk) More and more governments outside of Europe and North America are prepared to invest significantly in the development of the life sciences and biotechnology, which promise to become a measure of political and economic success for any country in the 21st century. This approach both celebrates academic and economic independence of the 'local' hubs of science and technology, and demonstrates their immersion in the global networks and processes of knowledge production. The proposed panel seeks to identify what impact global developments in science, technology and biomedicine have had when they take place in South Asia, which proved to be a dynamic site for biomedical research and life sciences, e.g. pharmaceutics, clinical trials, stem cell research, and population genetics. The panel has two different but inter-related objectives: 1) illuminating the processes of knowledge production around science, technology and biomedical research and 2) exploring the social impact these have had more broadly in the subcontinent. First, the panel investigates knowledge production in the areas of biomedicine and life sciences. What kind of repositories, facilities, skills, rhetorics, practices, sites and actors that are involved in the production of new knowledge and innovations in South Asia? To what degree is it embedded in the global context of the development in the life sciences? What is the relationship between regulation and standardisation, and creativity and innovation in this process? Second, in terms of the social impacts, the panel seeks to understand the social changes following the emergence and use of the new technologies, practices and discourses. For example, in what ways the new knowledge mirrors and contests the existing realities of local politics and forms of sociality? Has the new knowledge stemming from this research affected the way people organise, see and represent themselves? Have they offered new ways of manipulating history, kinship, and caste? How do local traditions absorb and challenge the advances resulting from biomedical research and vice versa? Finally, in what ways have South Asians abroad been incorporated into global bionetworks? The panel will bring together scholars from anthropology, sociology and social studies of science working in the context of South Asia and will provide a much needed forum for the discussion of STS issues particular to the subcontinent.

Participants:

Making human subjects into objects of research in clinical trials in Sri Lanka. *Salla Sariola, Durham University*

This paper investigates the emergence of clinical trials in Sri Lanka and elucidates this process through ethnographic fieldwork in 2008-2009 into the conduct of a particular pharmaceutical company funded phase 2 trial. More and more human subjects are required to fulfil the scientific, ethical and regulatory requirements of global pharmaceutical research, and India has been one of the areas where the rise has been the highest. The networks of global clinical trials have extended to Sri Lanka from India, Australia and the UK. In the 'search for human subjects' (Petryna 2009) there is an assumption that what is obtainable via multiple research sites is universally applicable data. The production of such, however, requires a site, procedures and standards that are equally universal, creating a system that validates itself. The paper describes how 'universal' knowledge concerning safety and efficacy of a drug was constructed in Sri Lanka. A trial site was set up, research protocol approved by a local ethics committee, patients recruited from a local hospital, informed consent forms filled in, drugs administered, process monitored, and adverse events cared for. In order to adhere to international standards of Good Clinical Practice, creativity as well as discipline, was required. In the analysis of this process the paper contributes to the recent debates in science studies about objects, how they are made and what they are made of (e.g. Mol 2002; Law and Mol 2006; Latour 2000). Moreover, the paper brings light to how those categories are fluid: how human subjects are made into objects in the process of knowledge production and how these roles were negotiated in encounters between doctors and patients.

Castes in the lab? Population genetic research in India. *Yulia Egorova, Durham University*

This paper explores the historical and cultural context and the political implications of population genetic research in India with a focus on the work of the Indian Genome Variation Consortium (IGVC). The Consortium represents a collaboration of several leading Indian laboratories of population genetics, which was formed to determine the extent of genetic diversity and heterogeneity of the Indian population with an aim to apply haplotype maps for disease association studies and pharmacogenetics. The article examines the way this research defines populations. More specifically, it examines the criteria used to define target populations, how scientists involved in these studies obtain and analyse their data, and how potential medical benefits of this research are conceptualised in their work. The paper is based on close reading of scientific papers on Indian populations and of popular academic and mass media commentaries, as well as on in-depth interviews conducted in India, the UK and the USA with scientists involved in research on Indian populations. It will be argued that methodologies employed and the research questions formulated betray geneticists' presuppositions about the basis on which boundaries between different South Asian populations should be drawn. These presuppositions seem to be determined by the current political discourses embedded in the historical constructions of the notions of 'caste', 'tribes' and 'races' on the subcontinent. The paper will contribute to the growing literature exploring the way the concepts of 'race' and 'ethnicity' are used in genomics and biomedical research (Duster 2005, Hartigan 2008, Marks 2003, M'charek 2005, Rose 2007).

Chair:

Yulia Egorova, Durham University

Discussants:

Kaushik Sunder Rajan, University of Chicago
Adi Bharadwaj, Edinburgh University

161. Critical Thinking on Science and Technology

1:15 to 2:45 pm
5: 522

Critical thinking is a relatively new trend in Japan. A large number of textbooks were published in Japan on this field last ten years. Both psychologists and philosophers are actively involved in this new trend, and wide varieties of subjects are taught under the name of critical thinking, from elementary logic to tips for effective presentation. In this session, we explore the possibility that cooperation between critical thinking community and STS community may be beneficial for both. There are several ways research on critical thinking can be relevant to STS. First, critical thinking education and STS education have some common goals. One of the goals of STS education is to acquire the ability to look at science and technology critically. Critical thinking skills will be helpful in formalizing the process (Aoki's paper deals with this aspect). Second, research on critical thinking can provide useful information for science communicators. For example, psychological research on critical thinking teaches us what can mislead us and what influence our judgments; this helps us avoiding misleading communication (Barton's paper). Logical analyses help science communicators find flaws in their presentation. Third, ordinary content of critical thinking education has the element of science communication. For example, it is common to teach knowledge on various psychological processes that lead us to an erroneous conclusion in critical thinking education. In a sense, this is a kind of science communication on psychological findings. Another example is a basic research literacy required to evaluate scientific (or pseudoscientific) claims. This is also a

kind of science communication that is routinely included in critical thinking education. This also means that the recent introduction of critical thinking in Japan is itself an interesting phenomenon from the point of view of STS (These aspects are discussed in Iseda's paper). Despite such multifaceted relationship between critical thinking and STS, the practitioners of the two fields rarely talk with each other. This session is a part of on-going project that explore the possibility of fruitful cooperation between the two fields. One possible obstacle for such cooperation is the difference in the attitude toward established scientific knowledge and scientific procedures. STS scholars generally have a reserved attitude toward scientific establishment. Many STS scholars accept social constructivism as the official doctrine of STS, and criticize the type of communication that naively assumes the correctness of scientists' opinion on so-called trans-scientific issues. On the other hand, the way scientific material is taught in critical thinking education seems to represent exactly the kind of optimistic view on scientific establishment criticized in STS. Does this mean that STS people and critical thinking people are destined to fight with each other? Not necessarily. Given the aforementioned shared goal of attaining critical attitude, the opposition should be reconcilable one way or another. This session is just a beginning of the steps toward such reconciliation.

Participants:

Critical thinking and bounded rationality. *Adrien Barton, Kyoto University, Graduate School of Letters*

Humans are cognitively limited beings, using heuristics to make judgments and decisions. These cognitive shortcuts lead to several biases in judgments, as illustrated for example by conjunction fallacy, base-rate neglect, or gambler fallacy - investigated by the "heuristics and biases" approach founded by D. Kahneman and A. Tversky. They also can lead to aberrant decisions (e.g. when following the heuristics "don't break ranks" led ordinary Germen men to commit a massive slaughter in Poland in 1942). Critical thinking could appear like a way to counter these biases, insisting on cognitive virtues like logical consistency, accuracy, precision or relevance. Carefully weighing all the available evidence, gathering all possible pieces of information, and making a judgment that would take into account all these parameters would be the hallmark of critical thinking and would help diminishing biases. However, relying only on these methods would be forgetting that because of various constraints (cognitive, time), human beings simply cannot always use critical thinking in a productive way. Moreover, in matter of judgments and decisions, less is sometimes more: by ignoring some part of the information and using simple strategies adapted to the structure of the environment (i.e. ecologically rational), heuristics can be very useful tools in making judgments, as had been shown in particular by the work of G. Gigerenzer the ABC group. Human bounded rationality does not equate to irrationality. It has been noticed that bounded rationality and creative thinking are not antagonistic (as can be illustrated by the "tools-to-theory" heuristic, which brought several important scientific progress). My talk will analyze the scientific literature in psychology in order to investigate how critical thinking and bounded rationality can work together in order to make good judgments and decisions. First, it should be noticed that the efficiency of heuristics (like the superiority of the "Take-the-best" heuristic over more complicated strategies) is ultimately evaluated by using the classical tools of critical thinking (logical consistency, accuracy, relevance). Therefore, the adequate use of such heuristics fits well the agenda of critical thinking. Moreover, even erroneous or incomplete judgments can be more adaptive than correct ones. For example, asking a tennis player about the reasons of his good swing will likely make him think about it and weaken his game. Additionally, how can one use efficiently the toolbox of heuristics? In which circumstances can one rely on this or that heuristic to make judgments and decisions? How can one estimate whether he is an expert in a field or not - and therefore, whether he should follow his intuitions? I will argue that critical thinking has a role to play there, enabling us to use heuristics efficiently. Finally, I will show how one can improve risk communication by identifying and exploiting the heuristic people use, using ecologically rational mode of presentations of risk (e.g. absolute risk reductions instead of relative ones, or natural frequencies instead of normalized probabilities) - thus fulfilling the standards of critical thinking.

Uses of history and philosophy of science in science education. *Shigeyuki Aoki, Aizu University, School of Computer Science and Engineering*

In this presentation, I will argue that history and philosophy of science (hereafter HPS), which has usually been discussed within the circle of the discipline, can help science course students to improve their critical thinking abilities on their subject matters. There are several reasons for this, and I will start with the explanation of the status quo concerning freshmen who first entered the university. One remarkable difference between high school education and university education in Japan lies in the latter's emphasis on the open-ended study for their subject matters, as opposed to the former's close-ended learning, i.e. cramming and application of problem solving for the entrance examination. As a result of this cramming process, most of the science course freshmen in universities lack critical attitudes and methods on their disciplines. Most of them get puzzled when they are suddenly required to show their "critical attitude" or "innovative thinking" which their institutions cry out as their slogans. I will suggest that HPS can provide a good starting point for such freshmen to transit from close-ended learning to open-ended study. HPS can liberate their minds and enrich their critical attitudes. Through my teaching experience, I find the merits of HPS as following: - HPS emphasizes the processes rather than the results of scientific changes in the history of science. Trials and errors of big-name scientists, and the background against which they fought to overcome the preceding theories, will be an excellent display of their critical attitues and methods. - HPS promotes students to think about science, rather than think within science. This feature of HPS is especially useful when teachers try to teach the methods, aims, and values of science in general. This allows students' critical treatment on their subject matters. - HPS draws on examples of diverse disciplines. Not only physics, but also biology, geology, psychology, or other disciplines are introduced. This undoubtly broadens students' views on science, enabling them to achive a more balanced view on their future specialities. In this talk, I would like to share the syllabus and course content on my lecture on history of science, while showing you the various responses of freshmen who attended the lecture. In the end of my talk, I will take up one critical voice of a student who apparently denies the value of HPS teaching to science course students, and point to a possible revision of HPS to more science course student friendly discipline.

How to teach critical thinking and STS at once. *Tetsuji Iseda, Kyoto University, Graduate School of Letters*

In this presentation, I propose to develop educational material that incorporates elements of both critical thinking and STS. Such a combination will enhance the strength of both types of education while making up the weakness of each other. Though critical thinking is a regular educational subject in many countries, that is not the case in Japan. The phrase "critical thinking" is introduced in Japan only in 1990s, and how to teach critical thinking in Japan is an issue that calls for much discussion. It is not yet recognized as an independent educational subject in Japan, so one promising approach for critical thinking education is to incorporate it in various courses. I argue that an STS course is a promising candidate for such incorporation. There are benefits for STS. Even though STS encourages critical attitude toward science and technology, it is rarely combined with concrete critical thinking skills. The power of STS will increase by formalizing the thought process used in the process. I also argue that the combination of the two types of material means more than efficiency in teaching. Critical thinking and STS represent different points of view on various issues, not necessarily congruent with each other. Similar cases are treated differently in the two fields. I maintain that the incongruence is

surmountable, and the result will be a more balanced treatment. To bring the argument to a more concrete level, I use a case study and present an educational material that has aspects of both critical thinking education and STS. The case used is the alternative medicine. The case is usually used in critical thinking education to illustrate the difference between scientific and ordinary thinking. Usually the correctness of scientific attitude is presumed. However, the case has many similarities with typical "trans-science" issues discussed in STS literature, where scientific opinions are regarded as partial or even inappropriate. The seeming discrepancy can be solved by using critical thinking at two levels; that is, critical thinking on critical thinking education itself (meta-critical thinking) will help to attain the goals of critical thinking education and STS education at once.

Discussant:

Masashi Shirabe, Tokyo University of Agriculture and Technology

162. Neurological Identities

1:15 to 2:45 pm

5: 524

The study of "bioidentities," how they emerge, evolve, and function, has become a major topic among STS approaches to modern biomedicine. Bioidentity comes in many varieties, but is always related to the way we understand our bodies, or particular body parts, not merely as our property, but primarily as defining our individuality in some fundamental way. Studies about organ donation show that patients or their relatives often feel the donated or grafted tissues somehow carry the donor's identity. This even happens in the case of such an eminently detachable body fragment as blood; some persons consider that their donated blood remains not just theirs, but literally themselves. Biodentities take the form of self-representations upon which people may act, as well as of more or less explicit norms for how to be a particular kind of person; these norms are conveyed by various agents, from laboratory scientists to marketing managers, from philosophers to policy makers, but also actively assimilated and transformed by those who enact them. As seat of the psychological functions (such as memory and consciousness) that, in the West, have long defined personal identity, the brain or its functional equivalent is usually represented as the only irreplaceable organ, such that some form of cerebral sameness ensures personal continuity. Especially since the Decade of the Brain of the 1990s and the rise of the brain scan as a modern icon, the brain has become a major bioidentity marker, and many social actors slide from the obvious fact that we cannot be without a brain to the questionable belief that we are essentially that organ. The notion that all human activity is dictated by the brain and that, therefore, theories about it must necessarily be neurobiologically-based, is the fundamental doctrine of various "neuro" projects that have developed since the early 1990s, from neuroethics, neurotheology, neuroeconomics, or affective and educational neuroscience, to the commercial ventures of neurobics and neuromarketing. It may well be that not all practitioners of these fields are ontological reductionists, or that some make cynical or interested uses of the "neuro" to attract prestige and funding. But the fact remains that the view of the human some scholars have encapsulated in the expression "cerebral subject" is a major one in contemporary biomedicalized societies. The cerebral subject, however, is not a transcendent entity, but exists only through the discourses and practices that embody it. It is plural, and the purpose of this session is to explore it under the form of different neurological bioidentities. We shall consider neurocorrelational attempts to contribute to psychiatric diagnosis, focusing on current efforts to revamp the nosography of depression. We will then examine how such neurologically based categories give rise to forms of "neurodiversity" among adolescents and autistic people, in relation to research in social neuroscience. Finally, we will argue from the view of "situated cognition" that no theory of the brain, however sophisticated, will be adequate to explain identity.

Participants:

Homogenizing depression through brain imaging technology. *Fernando Vidal, Max Planck Institute for the History of Science*

The present paper deals with attempts to homogenize the descriptive and nosographical heterogeneity of depression through the establishment, by means of brain imaging technologies, of neural correlates of the condition. Since the "Decade of the Brain" of the 1990s, the diagnosis and treatment of depression have experienced a spectacular expansion among adults and children, accompanied by an equally enormous (and actively marketed) growth in medication consumption. The World Health Organization has even claimed that depression is a leading cause of worldwide disability. As shown by a number of social science studies, among others David Healy's Let Them Eat Prozac (2004), Emily Martin's Bipolar Expeditions (2007), and Allan V. Horwitz and Jerome C. Wakefield's The Loss of Sadness (2007), the checklist mentality and the focus on symptoms fostered by current diagnostic tools (DSM-IV) obliterate situational contexts and contribute to pathologize painful and debilitating, but not intrinsically or necessarily pathological states. They not only define disease, but also play an important role in shaping individuals's experience and self-perception; they thereby sustain the increasing number of patients consumers who see themselves as bipolar, and act accordingly. Although many areas are explored in connection with depression, from genetics and neurobiology to developmental, interpersonal and social dynamics, neuroimaging research into its neural correlates increasingly appears as a particularly promising way to solve the challenges posed by the condition's high degree of comorbidity with other psychiatric disorders and the heterogeneity of the nosological category. Neurocorrelational imaging carries out with live humans the ethically impossible tasks of anatomo-pathology; and even if neuroscientists know that correlations are no more than correlations, many see them as indicators of material causes, and as capable, in the long run, of revealing essential causal mechanisms. In this framework, the ambition of neurocorrelational research is to "parse the heterogeneity" of depression, to decompose complex processes into "elementary constituents that can be studied in neural terms," to define depression subtypes and symptom profiles that are systematically related "to neural functional and structural abnormalities," and, in short, to revamp the "descriptive nosography" of psychiatric diagnosis on neuroscientific-causal foundations and through the identification of biomarkers. Such an ambition fits into a much larger universe of neurocultural projects ranging from neurotheology or neuroesthetics to the commercial ventures of neurobics and neuromarketing; and while there is no justification to deny the existence of biological underpinnings of depression, we shall examine how the neurocorrelational logic reinforces the proliferation of variations on the bipolar disorder diagnosis, and lends the prestige of the "neuro" to the creation of new patients and consumption products.

Wired up differently: autism, adolescence and neurological identities. *Suparna Choudhury, Max Planck Institute for the History of Science*

Facts about the brain are no longer confined to the field of neuroscientists and clinicians. They have in recent years entered numerous domains of everyday life in contemporary biomedicalized societies. Metaphors such as the "neurochemical self" (Rose, 2007) and the "cerebral subject" (Ehrenberg, 2004; Ortega & Vidal, 2007; Vidal, 2009) have been used to capture the "anthropological figure" underlying the neuroscientific theories that have diffused into popular culture and that continue to fuel the expanding genres of brain-based practices, technologies and therapies. The metaphor of the "cerebral subject" captures the reduction of a human person to his or her brain. With the constant popularization of these brain theories through newspaper and magazine coverage, popular science books and not least the strongly encouraged public engagement work of neuroscientists and neuroethicists (Illes et al., 2010; Morein-Zakir & Sahakian, in press), individuals find increasing opportunities to come into contact with versions of brain stories themed around being wired up differently, and to fashion themselves through such cerebral vocabularies. This paper explores the role of neuroscientific theories about human behaviour in processes of identity formation, drawing on research about the salience of brain-related metaphors for two groups of

people about whom neuroscientific research constitutes major themes: individuals with autism, and typically-developing adolescents. The categories of autism and adolescence are current Zeitgeist themes in cognitive neuroscience (particularly structural and functional neuroimaging) research, both which are increasingly concerned with social cognition, and moreover both which reinscribe and challenge the notion of pathology and normalcy. Both groups have in this context been characterized by having "different brains" from the norm. However, while many autistic adults draw on neuroscientific discourses to distinguish themselves, adolescents, by contrast, resist this biological vocabulary altogether. Through this comparison, and in the context of other examples of human differences which have been the objects of neurobiological and psychiatric study, this paper investigates the conditions for incorporation of neuroscience in processes of subjectification. In doing so, it demonstrate that the "brain stories" told by people to understand themselves and others are appropriated in different ways, have a range of meanings and give rise to different kinds of possibilities in their projects of self-making.

Situating identity: why we are more than our brains. *Ian Gold, Department of Philosophy & Department of Psychiatry McGill University*

Mind-brain reductionism, long abandoned in main-stream philosophy of mind, has been revived in the sciences of the mind by advances in neuroscience, and, more importantly, by popular accounts of what neuroscience can (or will) be able to tell us about mental life. One contemporary manifestation of mind-brain reductionism is what we may call the doctrine of neuroidentity - the claim that there is nothing more to one's identity than one's brain and its functions. The doctrine of neuroidentity is flawed both conceptually and empirically, and the purpose of this paper will be to explore some of the weaknesses of the view. Conceptually, the hypothesis is ambiguous. One can interpret it as a metaphysical supervenience thesis - as the view that changes in one's identity requires a change in one's brain (but not vice versa). Or one can interpret it as an empirical claim to the effect that a theory of human identity will be provided by neuroscience. As a metaphysical claim, the doctrine of neuroidentity is trivial; unless one is committed to some sort of metaphysical dualism, it is uncontroversial that changes in one's identity require changes in one's brain. As a result, the doctrine can hardly have been a discovery of neuroscience or be supported by particular neuroscientific findings. Neuroidentity isn't scientific news. In contrast, if the doctrine of neuroidentity is an empirical claim about the explanatory capacities of neuroscience, the hypothesis is largely unsupported by contemporary research. There is no evidence that neuroscience has developed any theoretical notion of human identity nor, more importantly, that it has a ready explanation of any of the characteristics that might be thought to be relevant: temperament, personality traits, preferences, rationality, or the like. As an empirical claim, therefore, the doctrine of neuroidentity looks vastly too optimistic. The central question about the doctrine of neuroidentity, therefore, is whether there is any reason to think that, despite the current state of neuroscience, it will, or could, eventually produce an understanding of the mind that would count as an explanation of human identity. Here we turn to an empirical limitation of the hypothesis. Recent work in cognitive neuroscience has provided ample support for the idea that some aspects of mental life are best understood as interactions with some features of the external environment. This view - called "situated cognition" - is not merely the claim that mind and environment interact but rather the stronger claim that the best theory of some human behavior or will have to represent it as an instance of mind-environment interaction. Situated cognition is relevant to the doctrine of neuroidentity because one element of identity - personality - seems to be best understood as a "situated" phenomenon. In the reminder of the paper, I review the evidence from social psychology that personality traits depend on interactions with the social environment. I argue, therefore, that no theory of the brain, however sophisticated, will be adequate to explain personality or, by extension, identity and that the doctrine of neuroidentity is false.

"Bare Life" in the Lab. The Emergence of Sheer Vitality from Agamben to Neuroscience. *Maurizio Meloni, University of Nottingham*

Giorgio Agamben's concept of "bare life" (Agamben 1998) has, over the last decade, received much attention from political theorists and philosophers (Calarco and De Caroli eds. 2007; Clemens, Heron, and Murray eds. 2008; de la Durantaye 2008; Ross ed. 2008; Norris ed. 2005; Mills 2009), but comparatively little from STS scholars (for instance, Rabinow 1998, Cohn 2004). This is quite surprising, given the extraordinary affinities between Agamben's idea of the emergence of a mere, cultureless and formless dimension of life as a consequence of its exposure to sovereign power, and the analogous emergence of a sheer dimension of the living due to the remaking of life's notion in contemporary genetics and neuroscience (Fox Keller, 2000) - the emergence of what has been called "life itself" (Franklin 1995, Rose 2006) at the level of its genes, neurons, and molecules. In this paper I make use of the rapidly expanding anthropological and sociological literature on neuroscience and its visualizing technologies (Kevles 1997; Beaulieu 2001, 2002; Dumit 2003, 2004; Joyce 2005, 2008; Alac 2004, 2008; Hagner 2007), to seek a possible application of the Agambenian notion of "bare life" to that specific figure of pre-linguistic and pre-cultural life that is aimed at and shaped in contemporary neuroscientific labs. In particular I am interested in the emergence from the neuroscientific labs of new forms of subjectivities such as the so called "neurochemical self" (Rose 2006) or "cerebral subject" (Ortega and Vidal, 2004; Ehrenberg 2004; Vidal 2009) that are emblematic in my reading of the widespread effort to reshape our form of life by putting at its center "the sheer vital dimension of existence" (Rabinow 1998), that is, by transforming "bios", the qualified life, into "zoe", life itself in its common anonymity. As the "bare life" investigated by Agamben, the "neurochemical self" and the "cerebral subject" above mentioned emerge as anthropological figures at the threshold of nature and culture, power and biology. I will conclude my paper by observing how such a focus on the visceral dimension of the living that is bare life has generated many expectations of an ability to account for the hidden bases of moral and social phenomena (from empathy to moral decisions). This offer of a sort of "moral simplicity" (Cohn 2004) crucially contributes, in a strongly anti-cognitive momentum, to the "seductive allure" of neuroscientific explanations (Skolnick Weisberg et al., 2008; see also McCabe and Castel, 2008).

Discussant:
Akihito Suzuki, Keio University

163. ICT Standardisation in Asia

1:15 to 2:45 pm
5: 531

The People's Republic of China has recently become remarkably active in the development of interoperability standards across many areas of Information and Communications Technology (ICT). Such standards are crucial for the creation of new industries and markets for novel ICT products and services. This engagement in standardisation is linked to the Chinese government's strategy to develop indigenous technologies and, in some cases through involvement in international standardization bodies, to put China at the heart of the next generation of global technical infrastructures. In this way China seeks to go beyond its globally competitive productive capabilities to acquire technology innovation capabilities. This strategy throws up important issues for China's technology promotion policy in terms of how to contribute to standardisation processes and of how to exploit public sector research and development. The entry of China into the shaping of these globally significant technologies will have far reaching consequences for developed economies and global ICT markets, posing challenges for industrial strategy and innovation policies across the developed and developing world. The EU has responded by seeking to align China's indigenous ICT innovation policies with the European Research Area. However the globalisation of innovation signaled by these developments, based upon

complex matrices of Intellectual Property, innovative capability and market knowledge from a wide array of industrial and research players across the world, calls into question simplistic established conceptions of 'indigenous' technologies. These developments raise a number of questions at different levels of analysis. This special edition therefore invites contributions from a range of analytical traditions encompassing innovation and technology studies, economics, policy studies to address the various issues raised by these phenomena. These issues include: * The changing role of standardization as mode of coordinating innovation in rapidly changing technological fields; * The respective roles of public Standards Development Organizations and of private consortia and the relationship between these; problems encountered by China (and lessons learnt) in engaging in global standardization processes; * The character and dynamics of ICT innovation in a context of convergence of technological infrastructures and rapid service innovation; * Theories of globalization and changes in the global political economy: the changing relationship between national, supra-national and global coordination of innovation; * The challenges for China (and other governments) in technology policy formation and intervention in complex rapidly changing technological fields. The complex interests surrounding such decision-making.

Participant:

Has China foundthe key for bridging the two incommensurable standard paradigms? *Xiaobai Shen, University of Edinburgh Business School*

The concept of "standards (BiaoZhun)" in China's imperial past and socialist tradition was chiefly linked to the state led top-down activities, and the rationales often concerned with something that today we might called "public good". In contrast, with the economic reforms and opening to the world, its experiences about standards have been associated with those vital technologies developed by corporations and/or consortia from the developed world, and under protection of the world IP regimes that China is unfamiliar with. The mode of technology development - "fast follower" does not help to overcome the hurdle that they face in technology innovation. Worse, having become the "world manufacturing base", the more Chinese companies have produced, the greater deal they must pay to the technology holders. The challenges facing China in relation to technology standards in particular vital ICT standards are not simply technical barriers. Rather they are institutional and conceptual barriers, which are deeply rooted in its past. However, the most recent progresses of China in ICT standards have attracted attention from the world about China's rising role in the standard field. Some believe that China will become one of the major players contributing to the world trend of convergence of standards. Others speculate that China might play at odds with the world current system and promote national interests driving the standard development to the direction of divergence. This paper from the tradition of technology studies, focuses on infrastructural ICT technologies in China in particular based on the case studies which are conducted by EU-China ICT standards research partnership that the author is a part of. This paper discusses the standard related elements/resources China has been able to draw from the state, industry and markets and the challenges it is still facing in the field. These China's activities in the field of standards are seen in the context of China's past experiences and the changing landscapes of the standards in the globalised world. In particular the current trend in ICT infrastructural technologies, the world sees the convergence of the three networks - telecommunications, Internet and broadcasting technologies and the digitalisation have brought about the technological changes, therefore are demanding new standards. Currently pertinent and segregated ICT standards are facing a new process of picking, mixing and integration; a new standard often consists of various sets of technologies (new and existing) and involves various institutions/companies from perhaps different countries. Standard marking processes become increasingly complex and dynamic because of the uncertainties involved in technological changes in the future and, moreover because of the prospects of social construction of the technological changes by today's players and their technical and social activities and decisions.

Chair:

Ian Graham, University of Edinburgh

Discussant:

Robin Williams, University of Edinburgh

164. The role of users in greening the built environment

1:15 to 2:45 pm

5: 532

It is generally acknowledged that end-users are an important factor in the creation and maintenance of a long-term sustainable resource use. How and when resources are consumed obviously determines the ability to create long-term sustainable systems. Users are also ultimately the ones who profit or suffer from the successful or failing transformation of socio-technical systems, which increases their importance as a key component of the system. Taking on the challenge of global warming, carbon-neutral settlements, low-energy dwellings and sustainable land- and water use become key issues. For this to succeed, new strategies for sustainable development taking place in housing and households need to be developed. This also concerns the relation between production and consumption - finding ways of building and designing for sustainable use, and putting insights and approaches into practice. Challenges for example relate to identifying and responding to dilemmas and obstacles such as rebound effects and conflicting interests, and coming up with solutions that appropriately empower consumers and facilitate sustainable use. At the same time, questions relate to what will make companies and other influential actors engage in such activities. The built environment has recently received attention from STS scholars. This is mirrored in publications, a new mailing list (BESTS) and sessions at STS workshops and conferences. By connecting this topic with sustainability issues we aim to take on an important societal challenge: the greening of the built environment. In this workshop we address these issues by inviting contributions discussing sustainable living and housing, especially under the following areas: 1. Examples of "sustainable residential areas", case studies and experiences from previous research projects and pilot projects 2. User behaviour in the home; energy- and resources used and user-technology interaction 3. Visualization of energy- and resource use in the households 4. Social sustainability in housing and households' everyday life and in planning and building of sustainable residential areas 5. Contributions addressing the issue of ecological versus social sustainability 6. Land- and water use in future sustainable residential areas 7. Architecture and/or product design for sustainable housing and life-styles 8. The role of industry in facilitating sustainable use

Participants:

User participation in future carbon-neutral settlements. *Erica Löfström, Norwegian University of Science and Technology*

It is generally acknowledged that end-users are an important factor in the creation and maintenance of a long-term sustainable resource use. How and when resources are consumed obviously determines the ability to create long-term sustainable systems. Users are also ultimately the ones who profit or suffer from the successful or failing transformation of socio-technical systems, which increases their importance as a key component of the system. Taking on the challenge of global warming, carbon-neutral settlements, low-energy dwellings and sustainable land- and water use become key issues. To develop sustainable energy systems, users need to transform their behavior and start reflecting on their energy use. The aim with this paper is to discuss different methods to achieve and maintain user participation in the building of new residential areas with ambitious goals for environmental sustainability. Every method has its drawbacks, but combining different energy- and resource visualizing methods could be one way to highlight households' energy use and their possibility to energy conservation. By using the results from the introduction of such methods when developing information campaigns and in energy guidance, as well as including energy- and resource visualizing equipment in the building of carbon neutral settlements, we can find strategies that appeal more closely to peoples' behavior, hence making it easier for households to put the advice into practice in their everyday lives.

On the premises for putting design for sustainable consumption

into practice. *Ida Nilstad Pettersen, Department of Product Design, Norwegian University of Science and Technology (NTNU)*

The environmental impact of many products and systems is biggest in the use phase, and the size varies with actual use patterns. The response to this has traditionally been energy efficiency measures and information about minimising the impacts of use. While increased technological efficiency rarely results in reduced energy demand, pro-environmental attitudes do not necessarily translate into pro-environmental behaviour. In design research, the focus for sustainability-oriented design has broadened beyond technicalities and into the domain of design disciplines more experienced in attending to use and users. With a theoretical parallel in the script concept (Akrich, 1992), it is from different perspectives investigated how design-led interventions may facilitate appropriate behaviours by empowering, guiding and motivating users or blocking inappropriate use, and solutions be designed to deliver functionality more effectively. The feasibility of integrating such interventions into mainstream design and business activity has not received much attention. Here, it is argued that the potential for design interventions to actually influence consumption must be seen in relation to how complex dynamics and a range of actors influence both what gets made and how use practices develop. Designers are equipped with tools and approaches for mapping and understanding current and envisioning future situations; for designing with and for users. Designing for sustainable use does however possibly require other conceptualisations and strategies than traditional design does, for example with regards to tackling conflicting goals and rebound effects. Moreover, the potential for radical innovations and large efficiency gains is associated with product portfolio management and decision-making in the early stages of innovation processes, leaving designers with limited influence. Taking on responsibility for variations in environmental and societal consequences of use is beyond the scope of most companies. Concepts such as practices (e.g. Reckwitz, 2002) and socio-technical systems (e.g. Geels, 2004) are considered relevant to design research aiming to theoretically capture and analyse the relations between technology and user; products and practices; production and consumption, and, to identify consequences and possible preconditions for designing and doing business in ways more likely to result in sustainable use. Drawing out the consequences of such perspectives on the links between production and consumption, and, in that light evaluating the adequacy of current design approaches, is proposed as one step towards identification and understanding of necessary conditions, frameworks and conceptualisations for design to contribute to transitions towards consumption. The limitations of STS contribution to design are also considered. An envisaged next step is to analyse the prospects for putting such thinking into industrial practice. References - Akrich M. The de-scription of technical objects. In: Bijker WE, Law J, editors. Shaping technology/building society: studies in sociotechnical change. Cambridge: MIT Press, 1992:205-224. - Geels F.W. From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory. Research Policy 2004;33(6-7):897-920. - Reckwitz A. Toward a Theory of Social Practices: A Development in Culturalist Theorizing. European Journal of Social Theory 2002;5(2):243-63.

Sustainable innovation in the building sector: low hanging fruit or mirage? *Thomas Berker, Norwegian University of Science and Technology*

Recently numerous initiatives have addressed buildings as the 'low hanging fruit' of climate mitigation. Greening the building stock, it was argued, is the most cost efficient measure to reduce climate gas emissions. Unfortunately, this reasoning presupposes green innovation to happen in construction - a sector notorious for its low degree of overall innovation. Expectations that the building industries would adopt the best and newest technologies and processes have been disappointed before. This is not to say that innovation does not happen in construction. Both on the level of individual buildings and of the industry as a whole constantly new materials, technologies and processes are employed. However, the heavy materiality of buildings produces special spatial and temporal aspects of building innovation, which pose specific challenges. The most prominent observation here is that construction is innovative mainly on the level of the individual project and contractor, but not on a broader scale. This leads to 'over-innovation', the wheel is invented anew on every construction site, without being able to learn from it. We get beyond programmatic statements complaining about construction lagging behind and calling for 'better construction' when we leave expectations generated by the comparison to mass produced goods such as cars aside. Instead, in this paper I propose to approach buildings as 'complex products and systems' (Winch 1998; Hobday1998). This means that buildings in important respects resemble products which are manufactured in small batches or even as single copy - for example flight simulators (Miller et al. 1995). In 'complex products and systems' the tailoring of components and processes plays an important role, since the savings through radical standardization do not provide significant advantages. From this perspective, locally confined 'over-innovation' remains a deplorable practice, but a necessary one, which needs to be better understood instead of being dismissed as unproductive waste of resources. References: Hobday, Mike. 1998. "Product complexity, innovation and industrial organisation." Research Policy 26:689-710. Miller, R., M. Hobday, T. Leroux-Demers, and X. Olleros. 1995. "Innovation in complex systems industries." Industrial and Corporate Change 4:363-400. Winch, Graham. 1998. "Zephyrs of creative destruction: understanding the management of innovation in construction." Building Research & Information 26:268-279.

Presenting Author:
Darryl Low Choy, Griffith University

165. Engaging Publics/Engaging Technoscience in the Asia-Pacific Region III: Techno-Life Sciences

1:15 to 2:45 pm
5: 533

Summary This session is the third of three sessions the new Asia-Pacific STS Network is presenting at 4S as a panel. This one is on techno-life sciences; the first and second sessions follow the same theme of engaging publics/engaging technoscience, but raise two other highly relevant STS topics in the Asia-Pacific: environmental sustainability transitions and Indigenous knowledges respectively. Contemporary technosciences governance requires new practices, different institutional arrangements, new networks and forms of public participation about technoscientific innovation. This session will explore strategies for engaging publics in technosciences innovation and governance and the understandings that inform those strategies in the Asia-Pacific region (that is, countries of Australasia, East Asia, SE Asia and Oceania) with regard to techno-life sciences. Papers provide critical analysis of engagement strategies across technical/non-technical boundaries and the way these boundaries are confounded and reworked in particular contexts. In that analysis, the papers reflect on the limitations of, or constraints to, inclusive particaptory approaches, reasons behind it, and on how public engagement in decision-making might be enhanced in/for the future. Central questions informing the session include: What are the particular challenges that we face in the Asia-Pacific region? What changing or new practices of technoscience governance are emerging and how effective might they be? What is the role of government and/or the role of civil society in technoscience governance? Do current developments suggest 'public talk' or a genuine move towards a paradigm shift in governance, and what are the implications of either? What trajectories of particaptory governance might contribute to better civic involvement in policy steering and result in better policy outcomes? Rationale Unique and complex technoscientific issues have created formidable social challenges for the future. For all their promise, technoscience innovations are immersed in controversy, public distrust, complexity, and scientific and social uncertainty, for example, GM crops, nanotechnology, hard water management approaches, wind energy, stem-

cell research, neurosciences, cloning, tissue engineering, and so forth. The speed at which new developments demand attention is accelerating. These sessions address these important issues and social controversies for technoscientific governance which is an important area now being widely addressed by STS scholars, and aligns especially to the following key themes of the 4S conference: public engagement/social movement and science, technology, and public policy. Contribution to STS The three Asia-Pacific STS Network sessions contribute to a key STS issue: technosciences and their governance at a pivotal time when the ground rules that connect citizens to the state are up for revision and reformulation, and when experiments with technoscience/society dialogue are available for critical analysis. In addition, the session highlights the Asia-Pacific region as a new focus of inquiry that departs from the usual focus on the US and Europe. The Asia-Pacific is an emergent and important area in world politics, trade, and technoscience development and because of its diverse cultures (both non-indigenous and indigenous) and socio-political contexts offers a valuable 'point of difference' (or 'politics of differences') for discussion on and insights in a contested localising-globalising world where technosciences are convergent.

Participants:

Greater Control or no Control of Nutritional Choices: Food Safety Debates on Functional Foods. *Tomiko Yamaguchi, International Christian University*

This paper examines a recent incident in which scientific advances which offered consumers greater control over their nutritional choices are now perceived by many as resulting in a betrayal of the implicit promises to consumers. Health conscious Japanese consumers have contributed to a high demand for health foods such as functional foods (e.g., calcium-fortified foods, dietary fiber soft drinks and fermented soy protein drinks). In an effort to improve the health of the population, the government has also encouraged the development of a diverse range of products for consumers. Functional foods were held in high regard by consumers who wanted to make intelligent, healthful food choices and who believed that scientific advances in nutrition and food technology could contribute to their well-being. However, a recent (September 2009) incident may cause consumers to rethink their assumptions about functional foods: Kao Corp., a chemical and cosmetic company, has temporarily suspended sales of its Econa brand products, including its cooking oil, salad dressings, and mayonnaise, because the fatty acid glycidyl esters in them could be carcinogenic. At present, a great deal of controversy is erupting and stakeholders are revisiting the food safety issues surrounding functional foods. The controversy in progress thus offers an interesting case study of a situation in which consumers have been promised that scientific advances in food production will empower them to make wise choices in food, and have now learned that there may be catastrophic consequences for believing these promises. Against this background, this paper identifies the key stakeholders in the functional food debates, their interpretation of the incident, and critical changes in the tenor of discussion before and after the incident. The paper argues that although the functional food markets in Japan purport to offer consumers a choice, the promise that scientific advances in food production will offer the average, non-expert consumer greater control over his own nutrition and health is in large part an illusion, and that this incident will shed light on consumers' perceptions of the benefits and hazards of the 'scientification' of food.

Localities and Temporalities in Stem Cell Research: Dynamics of Expectation in the UK and Australia. *Nicola Marks, University of Wollongong*

The ways in which stem cell researchers talk about the promises of their work are examined here in order to explore the dynamics of expectations and suggest avenues for improved public engagement in science. The sociology of expectations examines the socially and temporally located dynamics of expectations. It suggests that discourses about particular areas of science or technology can follow a standard narrative: discourses about areas in early stages of development are characterised by optimism, whereas those about more established areas are characterised by a focus on obstructions to the realisation of previous promises. This narrative structure is often seen by scientists as necessary to generate investment opportunities and support for research in its early stages. However, it is problematic since it can lead to disappointment and may contribute to troubled science-public relations, particularly given the power of scientific voices to shape public encounters. To foster genuine participatory governance and public engagement in science, it is essential to further explore these promissory discourses. This paper aims to do this by examining how stem cell researchers talk about their work in different contexts. It draws on data from in-depth semi-structured interviews and group discussions with 54 stem cell researchers and from publicly available materials. In particular, discourses from diverse geographical locations (UK and Australia) and social locations (different distances from knowledge production, levels of seniority and media experience) are investigated. These discourses also arguably emanate from diverse temporal locations. At the time of data collection, the policy environments in these two countries were different with regard to a particular technology, so-called therapeutic cloning: it had been legalised in the UK, but was still under a moratorium in Australia. Thus, this technology can be constructed as more established in the UK, and discourses from scientists working there may fit in to a different location in the 'optimism to obstruction' narrative structure. Examining an area of science which is global, yet shaped by local factors, draws out aspects of these scientists' discourses which should be promoted to support legitimate participatory governance.

Professionalization and Globalization of Synthetic Biology: Images, Rhetoric and Cross Cultural Challenges. *David Mercer, University of Wollongong*

The recent emergence of synthetic biology has stimulated numerous discussions about what forms of regulation are desirable to address its possible negative social and environmental implications. Given regular claims that the field is not only generating new forms of knowledge and applications, but also new modes of knowledge production, many synthetic biologists and social scientists have suggested that approaches to regulation also need to be novel. Various model approaches to regulation have been suggested: scientific self-regulation, experiments involving the 'upstream' collaboration between social scientists and scientists in the early phases of research projects and for the field to become professionalized. In the following presentation I will pay specific attention to this last strategy focusing in particular on the challenges of constructing a unified synthetic biology profession across different cultural settings and national regulatory environments. Whilst being sensitive to some of the limits of such strategies the most articulate advocacy of professionalization as a governance strategy for synthetic biology can be found in a recent discussion paper by Weir and Selgelid [Syst Synth Biol (2009) 3:91-97.] Weir and Selgelid outline the numerous benefits offered by professionalization relative to other approaches to governance. They suggest that professionalization overcomes dichotomies such as 'upstream vs. downstream', 'fact vs. value' and 'community vs. state'. I will discuss the strengths and weaknesses of their arguments paying particular attention to the challenges involving constituting one profession field across different nation states, regulatory systems and cultures. It will be argued that the strategy of professionalization may be important in encouraging shared global 'meta discourses' to describe ethical concerns but that it faces significant limitations as an approach to regulation as there can be considerable potential for 'local' re-interpretation and for diverse practices to be justified within shared professional discourses. These theoretical themes will be illustrated by considering analogies to the different practical implications of shared techno-scientific professional discourses in Japan and Australia and the US in relation to medical and cetacean research.

Engaging the Public's Imagination: Fantasy in the Media within

the Australian Stem Cell/Cloning Debate. *Casimir MacGregor, Macquarie University*

This paper examines dystopian fantasies of human cloning and stem cell science during the Australian debate on human embryonic stem cell (hESC) and cloning research that appeared in the national news media from 1999 until 2009. News media is an important site for exploring diverse and complex cultural images of hESC and cloning research, and the mechanisms by which these images are reproduced, invoked and interpreted within the public's engagement with science. The media is a form of social space that operates at the interface between scientists, the public and the polity. The media's centrality in everyday social relations means that it plays an important role in shaping public perceptions of hESC and cloning and its utopian promise or dystopian ills. Many Australian media stories invoked images and fantasies of the horrors of Nazi medicine, mad scientists and rogue biotechnology corporations. These fantasies represent a similar story, one in which the human embryonic stem cell and cloning debate updates and re-dramatises human anxieties that come with new technologies. In the case of hESC and cloning research, the lack of clear and confident institutional or governmental control in an area with great cultural, ethical and moral importance exacerbated this sense of uncertainty. When confronted with such uncertainty or ambiguity, human beings typically switch their focus from the world around them to the world within- to their own emotions, their own thoughts, their own bodies, their own cultural beliefs and to the realm of fantasy. In this paper I employ the concept of fantasy as a category to highlight 'fictional reality.' The notion of fantasy highlights individual's and society's imaginative potentiality that is central to their making of political realities. I am not arguing that 'fantasy' is conceived as an alternative reality, but that 'fantasy' is an essential driver in the shaping of politics and is a part of everyday life in how we make sense of the world and engage with techno-science.

Bounders, Boundary Riders and Unbounded Liberals: Towards a Typology of Scientists' Practices of Engagement with Society. *Karen Cronin, Institute of Environmental Science and Research Limited, NZ*

Recent trends in science governance indicate the growing use of public opinion surveys to define the stance of citizens in relation to science, including their propensity to 'engage with' emerging technologies. Government funded studies identify citizen responses with greater or lesser interest, trust and approval for science. In a UK survey later replicated in New Zealand, members of the public were asked about their understanding of science, science and technology risks and information sources. The more positive respondents were categorised as Confident Science Believers, Educated Cynics, or Concerned Science Supporters. Less supportive respondents were described as Confused and Suspicious, Uninformed Individualists or as Left Behind. This kind of research appears to have continuing currency in science policy and remains an important driver in the design of science communication and public engagement programmes. While useful for science literacy objectives, this approach reinforces an asymmetry in the 'science and society' relationship in which citizen responses to scientific knowledge are framed as problematic, but less attention is paid to the responses of scientists to citizens and the social context of science. This paper challenges this construction by focusing on scientific interest in and understandings of citizen knowledge. From a study of scientists' involvement in the genetic engineering debate in New Zealand, I identify a range of approaches among scientists, from those who express low levels of trust in public judgements and who are antagonistic towards civic challenges to science and public involvement, to those who express high levels of trust in public judgements and are open to public involvement. While most scientists seek to maintain a firm boundary between scientific and public epistemologies, an increasing number are interested in engaging across the boundary line and some are actively breaking down those distinctions. Drawing on these observations, and other studies of scientists' views on science communication, I propose a typology of scientists' understandings and practices of engagement with society.

Chairs:

Tomiko Yamaguchi, International Christian University
Karen Cronin, Institute of Environmental Science and Research Limited, NZ

166. Presidential Plenary: Creative Connections between STS and Communication Studies

3:00 to 4:30 pm
13: 1323

Chair:

Judy Wajcman, London School of Economics & Political Science

Panel Members:

Joo-Young J. Jung, International Christian University
Christian Licoppe, Telecom Paristech
Trevor Pinch, Cornell University

167. 4S Business Meeting

4:30 to 5:30 pm
13: 1312

168. Microsoft Research Reception

5:00 to 6:00 pm
University Coop Restaurant: 1F

169. Banquet

6:00 to 8:30 pm
University Coop Restaurant: 2F

SATURDAY, AUGUST, 28

170. Pregnant Bodies: New Technologies, Images, and Discourses (1)

9:00 to 10:30 am
12: 1212

Participants:

Indivisualization(s) in obstetric ultrasound. Part 1: Indivisualizing providers. *Ann Rudinow Saetnan, NTNU*

In this paper I reanalyze my data from a study on the meanings and practices of obstetric ultrasound, especially in Norway. These data (comprised of provider and end user interviews, mass media articles, medical journal articles, and public documents) date from 1985 forward to the present. One phenomenon among others that characterize this period is an emphasis on individualism, in many and sometimes contradicting forms. This paper is the first in a series of three which are "trial balloons" for a forthcoming book that will focus on discourses where ultrasound visualizations and individualizations intertwine. This paper explores four rhetorical indivisualizations of the ultrasound service provider: -The ultrasound provider as pioneer. -The provider as defined by his patient. -The provider as bestower of patient individuality and autonomy. -Boundary battles and provider categorizations

New Reproductive Technologies and Emerging Moral Vocabularies: An Agenda for Studying Technologies-In-Action. *Sigal Gooldin, Hebrew University of Jerusalem*

Since the birth of the first 'test tube baby' in 1978, the biomedical field of the 'New Reproductive Technologies' (NRT) developed rapidly and extensively, creating a range of unprecedented reproductive options that touches upon the very basic definition of kinship, culture/nature and life itself. One of the most known and controversial procedures in this area is In Vitro Fertilization (IVF), a procedure involving extracorporeal fertilization that become a routine treatment for infertility in high tech societies.

The growing anthropological studies of NRT in general and IVF in particular demonstrate that these technologies become tightly interwoven in the complex matrix of moral imagination, and that they are often linked to a juncture of interests and power structures (e.g. scientific, national, economic, religious, gendered etc.). This seem particularly relevant in Israel, where the rates of IVF utilization are the highest in the world, and where IVF treatments are generously funded by the National Health Insurance system and enthusiastically embraced across many sub-groups. The point of departure for this paper is that while most critically applied studies NRT view them as mere reflections of already existing 'regimes of justifications', scant attention has been paid to the active role played by these technologies in creating, transforming and re-shaping the moral vocabularies of the concrete local networks. This paper aims at filling this gap by integrating two analytical frameworks: Latour's 'post-phenomenological' perspective and Boltanski and Thévenot's anthropology of morality. The paper is based on an extended case-study: a public dispute over the regulation of IVF in Israel, which took place in 2003 and 2004. In this dispute, an existing public health policy, which up until that time funded IVF almost unlimitedly, was threatened by proposed budget cuts. The proposed change of policy triggered a heated public debate, participated by a multitude of social actors (e.g. policy makers, politicians, economists, health experts, clinicians, IVF consumers, and media agents). The paper conceptualizes this dispute as a 'public drama' shaped by two complementing processes. The first one involved 'acting-out' and negotiation over existing moral repertoires regarding 'technologies of life' and 'reproducing bodies' in Israel. The second involved the emergence of novel moral vocabularies and moral communities, which challenged existing national and religious justification regimes. The findings of this study show that in the frame of these processes some of the taken-for grated oppositions (between Palestinians and Israelis, Arab and Jews, Non-Jews and Jews) were dimmed, spaces of shared vulnerability were formed, and new co-operations were mobilized. I argue that these are some of the unintended and unexpected consequences of NRT in Israel and that further attention should be paid to the ways in which NRT affect, and potentially modify the moral vocabularies of concrete local networks.

The sequential organization of technologically mediated vision: An aspect of prenatal ultrasound examinations. *Aug Nishizaka, Meiji Gakuin University*

In this study, I examine some uses of a particular referential form in prenatal ultrasound examinations; the referential form that I focus on is the reporting form with the locational demonstrative koko (here or this place) which is followed by the post-positional particle ga. That is, health care providers frequently use the locational report of the form "koko ga (This place is) X" in prenatal ultrasound examinations. The purpose of this study is to demonstrate how both health care providers (HCP) and their clients, i.e., pregnant women (PWM), orient to different aspects of the technology at different sequential positions in the actual course of interaction in an examination. Prenatal ultrasound examinations are characteristic in that there are two common operational fields: The monitor screen and PWM's abdomen. The monitor screen is visually oriented to by both participants. PWM's abdomen is a field for the operation of the transducer in HCP's hand to capture the image of the right fetal part; the operation of the transducer can also be (tactilely) felt, as well as seen, by PWM. The third operational field is the control panel; this may be a field specifically for HCP, but one should note that HCP's operation on the control panel is performed in front of PWM; HCP's operation of the control panel is seeable to PWM, though PWM cannot see what exactly HCP does on the panel. The most characteristic technological feature of prenatal ultrasound examinations thus lies in the spatial separateness of the basic operational fields for the participants, which the participants orient to in different ways. The issue is how they jointly coordinate their orientations to these fields with one another. The use of the "koko ga (This place is) X" format is very restricted (at least in Japanese); it appears that it is only used to reference a particular location within a particular region. For example, one can say "koko ga the post office" to show a particular location on a map, but one cannot say "koko ga NN" to show a person in a photo. The format can be used to reference a relative positioning in a relatively larger area. The issue is what the procedural ground for the use of the format is in the actual course of interaction. In this study, I adopt the ethnomethodological/conversation analytic perspective. First, I explore the pairing of an ultrasound image on the monitor screen and organizational lived work of producing and seeing it (Garfinkel); this pairing engenders the order of what one sees on the monitor screen appropriately in the current status of interaction. Second, I explore the sequence organization (Schegloff), based on two-utterance sequence type; the use of a locational report at different sequence-organizational positions is grounded on, and exhibits, different orientations toward the operational fields. This study contributes to the elucidation of the intrinsically interactional nature of the technology and explication of the interactional structure of prenatal ultrasound examinations.

Good eggs: young women as 'ideal' donors for stem cell research. *Margaret Boulos, University of Sydney*

This paper will describe a study currently being carried out into women's perceptions of egg donation for stem cell research. Since the Hwang scandal, the pressure has been on scientists, research companies and policy makers to find ways to procure the eggs required for stem cell research without generating significant controversy. From a biomedical perspective, egg quality declines with age; younger women (18 to 30) are in peak fertility compared to older women, particularly those who utilise fertility services. IVF patients currently represent the major suppliers of clinically-unviable eggs to stem cell research, yet the likelihood that fertility patients will provide enough viable eggs for research is low. Populations of young women will most likely be targeted through payment schemes such as those introduced by the state of New York in 2009. The biopolitical implications of this issue are complex. On the one hand women delay childbearing for economic and social reasons, while governments in developed nations are designing ways to encourage women (notwithstanding the perennial marginalisation of young single mothers) to have more children. Providing eggs for stem cell research in this high-fertility/low birthrate stage can perhaps ensure the best of both worlds for governments investing heavily in stem cell research while keeping an eye on fertility rates. However, there is little research on the long-term effects of egg extraction on fertility or general health. Mobilising young women as ideal donors for stem cell research is still largely unrealised yet questions must be considered about the implications that such positioning can have for young women, clinics and stem cell scientists. Critical, social-scientific examinations about the experiences of IVF patients (Franklin, 1997; Thompson, 2005) and more recently, their decisions to provide embryos for stem cell research has emerged (Parry, 2006; Franklin, 2006; Haimes et al 2008), generating more complex understandings of embodiment and its implications for regulatory policy. There is research on donors/vendors for the reproductive egg market, particularly in the US [Klock et al, 1998; Braverman and Corson, 2002], but little is known about young women in relation to stem cell research in other national contexts. Young women, whose economic marginality positions them very specifically to the development of egg procurement programs and the emerging bioeconomy is explored in this paper. Drawing on data gathered from interviews and focus groups, this paper will compare responses from two cohorts: young women and IVF patients, about their perceptions of egg donation for stem cell research. The data will show how women operate within particular social, economic and reproductive relations that impact on decisions about participating in an emergent bioeconomy. The paper will discuss implications for regulatory policy and highlight issues in the debates that frame them.

171. Green Science

9:00 to 10:30 am
12: 1213

Participants:

Does Fuel Cell Research Uphold Environmental Communication? East Asia Evaluation. *Roger S Chen, Chinese Culture University*

Research and development (R&D) activities of renewable energy as part of environmental policy disposition are said to germinate local industrial niches and national carbon reduction. In reality, the optimistic expectation may not be easily fulfilled due to the constraints of technological readiness and the uncertainties of future market, in particular for the newly industrialized countries. However, one may argue that the effects of such research activities are at least able to foster the knowledge capital and environmental concerns in national innovation system. Taking the second argument, question regarding whether environmental concerns has evolved and expanded among research actors along with R&D involvement, this paper evaluates the research effects of fuel cell and its relevant hydrogen technology in terms of environmental communication. Four countries in the East Asian, namely China, Japan, South Korea, and Taiwan, are under investigation, countries which all face the predicament between economic development and environmental sustainability. The study is based on network analysis and information theory to explore the discourse conducted by the major fuel cell research partners including industries, universities and governments, and the dynamics of information distribution among those actors. From the perspective of environmental communication, the results of the study indicate the limitations of fuel cell research involvements in responding climate issues and offer some suggestions for remedy, which by itself constitutes an alternative evaluation based on environmental concerns.

The Emergence of Green Chemistry. *June Jeon, Graduate program of science and technology policy, KAIST(Korea Advanced Institute of Science and Technology)*

This paper is part of a larger research project which analyzes the role of chemists in the creation of a new scientific discipline known as "green chemistry". Green chemistry originated from the Alternative Synthetic Pathways for Pollution Prevention program, founded in 1991, by the Office of Pollution Prevention and Toxics (OPPT) of the United States Environment Protection Agency (EPA). Though the government provided the initial guidelines and supported the endeavor with grant programs, the specific research problems and goals of green chemistry were devised by chemists themselves, in negotiations with other actors such as industry as well as government. Before they became interested in environmental issues, chemists were concerned mainly about improving the yield or efficiency of chemical reaction, discovering new catalysts that will increase the rate or selectivity of the process, or a new molecule or chemical process that will extend the frontiers of chemical knowledge. Green chemistry represented a genuinely new departure for them, since "sustainability" came to replace their more traditional research agenda in creating this field. Initially, their understanding of "sustainability" varied according to their specialty. Therefore, the question "what is green" first had to be answered, and then ways to achieve the negotiated goal of sustainability had to be determined. This paper will thus show that: (1) the goals and specific research problems of green chemistry have been formulated by chemists who, in response to government initiatives, sought ways of extending their expertise to environmental issues; (2) and over the years green chemistry has experienced substantive growth, which are measurable in quantitative terms. It is generally accepted among historians and sociologists of science that scientists are often influenced by political agenda; this study supplies a further example. Among the many factors that contributed to the emergence of green chemistry, such as global politics and economic interests, this paper will focus on the interaction between chemists and government, and the process whereby chemists' revised the trajectory of their discipline to embrace the environmental agenda. This study provides the first full historical analysis of the origins of green chemistry, and is intended as a contribution to the history of environmental science in general.

The Capacity of the Seed: the emergence of the food security problematic. *Elizabeth Bullock, Graduate Center, CUNY*

This paper examines the recent development of food insecurity as a social, political and economic problem. The idea of food insecurity has emerged with what I call a food security assemblage or an environment where the form of problem and its solution - insecurity/ security - are co-constitutive. Increasingly, insecurity/ security has become the form of address for global hunger. I argue that how food insecurity emerges as a problem, in addition to the continuance of the programs developed by institutions in this assemblage, is central to how we understand governance and economy in neoliberalism. Particularly of interest are philanthropic investments in the agricultural sciences and the way these investments have influenced global governments, the economy and the market. I take the recent emergence of the Global Seed Vault at Svalbard as a point of departure. Affiliated with the Vault are an assembly of institutions including the United Nations Food and Agriculture Organization (UN FAO), the World Bank, the Rockefeller Foundation and, more recently, the Bill & Melinda Gates Foundation. The records of these institutions reveal a thorny array of social, legal, administrative, and financial arrangements. This paper will focus on records from the Rockefeller Foundation, comparing investments in the 1960s-1970s with their recent interests. These comparisons will allow for closer examination of how this problematic has emerged and will distinguish current interest in food security from their earlier work on population and food problems. Advocates of food security today characterize the seed both in terms of diversity that must be protected and in terms of innovation that must continue: the seed figures all at once as both insecure and secure. For these proponents, food security is a global initiative. I intend to question how all of agriculture has become part of an environment that is profoundly influenced by developments in the agricultural sciences and where crop diversity is now viewed as essential to the sciences of plant breeding and agronomy. In this environment, for crops to be competitive against potential threats (e.g., against pests, climate change, etc.) plant breeders and researchers need information and access to local seed collections around the world as well as insight into the relationship between genetic traits and the environments where particular crops are grown. In this schema, no country has enough diversity to be self-sufficient because there is always the potential for varieties of crops to fail against new threats and for varieties to improve with the addition of new traits. In this way we begin to see how Rockefeller's earlier investments contributed to an environment that necessitates continued research in the agricultural sciences. However, with food security and its assemblage there has emerged a new form of address for global hunger - food insecurity / security - along with arrangements that insure the continuance of this assemblage.

172. The Migration of Researchers and Science Policy Evaluation

9:00 to 10:30 am
12: 1214

Participants:

No Permanent Exiles: The Intellectual Migration of Japanese Biomedical Researchers after World War II. *Buhm Soon Park, Korea Advanced Institute of Science and Technology*

In 1968, the Harvard historians Bernard Bailyn and Donald Fleming made a serious attempt to analyze the intellectual migration as a social phenomenon on the global scale by editing memoirs and monographic articles entitled "The Intellectual Migration: Europe and America, 1930-1960." Immediately recognized as groundbreaking, this volume has generated much enthusiasm for the study of the movement of "intellectuals" as carriers of "ideas," a trait that set it distinct from other waves of

immigration. Various fields in science, humanities and social sciences especially touched by powerful émigré intellectuals have been examined, and the scope of the study has been expanded beyond the U.S. to include Great Britain, Canada, China, and some countries in Latin America. And yet, the literature is considerably limited to the exodus of intellectuals from Hitler's Europe (i.e., "forced migration"), their cultural transfer and adaptation through what one called "permanent exiles", and the spread of European ideas to the other parts of the world (i.e., "Eurocentric vision"). This paper seeks to broaden the study of the intellectual migration by examining the flow of Japanese biomedical researchers into the U.S. in the second half of the twentieth century. Their movement was voluntary and opportunistic (i.e., not forced), and it offered multiple career options beyond permanent settlement in the U.S. Furthermore, the migration indeed took the pattern of a migratory bird, visiting and revisiting the same place at a certain interval. I will show that some historically contingent factors allowed the U.S. government labs in the National Institutes of Health to play a pivotal role in hosting the Japanese scientists, who found a new destination of overseas study other than war-torn Europe, especially Germany.

Research on Scientific Science Policy Analysis and Evaluation with STS Perspectives. *Gouk Tae Kim, Virginia Tech*

This research examines the implications of the emerging scientific science policy framework across countries for the STS community's research on science policy and the technological innovation process. I also seek to explicitly extend the reach of the STS discussion and approach to the development of the scientific science policy framework by examining and applying the theoretical and operational approaches of scientific knowledge and facts to formulating tools for scientific science policy analysis and evaluation. The scientific science policy framework has been developed to provide toolkits for policy makers when they need to analyze and evaluate their R&D investments. In the U.S., the science policy framework has primarily emerged as an answer to the call by science policy advisor Dr. Marburger III. As the Bush administration's science policy advisor, he emphasized the need to create a new objective science policy framework for examining science and technology policy expenditures. One of the key assumptions of scientific science policy is that science policy and R&D assessment should be formulated objectively based on scientific evidence. Launching the NSF's SciSIP (Science of Science and Innovation Policy) program in the U.S. can be regarded as one of the efforts of the science policy research community and policy makers to respond to this new demand for establishing a scientifically informed science policy approach. However, though science policy scholarship has aspired to interdisciplinarity, it has relied on a narrow range of social themes. Thus, this research attempts to integrate interdisciplinary science policy approaches including STS into developing scientific science policy analysis and evaluation models that would be useful for science policy makers and others in the scientific science policy community. As a research method, I compare scientific science policy programs among the U.S., EU, Japan, and South Korea, which have been established to design and develop analytical tools, explanatory models, and datasets for analyzing and evaluating science and innovation practices and policy strategies. In addition, by gathering perspectives from a range of traditional science policy scholars and STS scholars focusing on the emerging scientific science policy framework, I propose an innovative science policy model that incorporates STS scholarship on scientific and technological innovation into scientific science policy framework. Through this research, the following broader impacts on Science, Technology and Innovation (STI) policy and the STS community could be anticipated: First, this research will broaden the purview of the scientific science policy framework to better integrate a range of social scientific perspectives. Doing so should provide useful resources for future science policy researchers; second, this research would encourage STS scholars to translate STS theories and approaches into models that fit the needs of the scientific science policy community; third, since the STS discussion on scientific knowledge and facts in society is related to the discussion of the democratic aspects of the science and innovation process in terms of public engagement in national science R&D initiatives, this research will also encourage the expansion of scientific science policy research into covering democratic aspects of science policy and science research.

Designing the Outcome Evaluation of the CREST Program. *Hideki Yoshida, Japan Science and Technology Agency*; *Tadashi Sasa, Japan Science and Technology Agency*

The Japanese government has made a massive investment in basic research since the inception of Science and Technology Basic Plan in 1996. Ahead of this, the CREST program, one of the major programs for basic research in Japan, was launched in 1995. Now there had been six projects of the first five years from their expirations, we designed the framework for the outcome evaluation of it. Knowing of the limitations of the quantitative indicators, our outcome evaluation was based on the expert review and qualitative evidences with the specific and factual description which suggested the impact on science, technology and socio-economy, in addition to the conventional data. In this presentation, we report how to design the framework for the outcome evaluation of the CREST program and what to provide as the evidences for it, specifically focusing on a particular CREST project. The CREST program is intended to promote the innovative science and technology in Japan and plays a pivotal role in the competitive research funds. One of the features of its scheme is the interdisciplinary team approach to achieve the target strategically set by the government. As five years have passed since the termination of the first six projects, we have made a first attempt of the outcome evaluation, aiming to shed light on what was seen or had not yet been seen at the ex-post evaluations. The outcome evaluation has a significant value especially in basic research because the benefits are long-term in nature and are realized only after an extended development period [1, 2]. Based on the classification of the different types of benefit from basic research by Martin et al. [3-5], we designed the biaxial evaluation views of research output itself and research outcome, and the latter was further broken down into the view of the science and technology and that of socio-economy. On the other hand, many methodologies have already been attempted to measure the outcome of research. By and large, the methodologies are classified into three types: historical trace of the knowledge input, measuring research outputs, and economic theory/economic methods employing productivity growth [6]. However, experiences of previous evaluations by other foreign agencies are telling that the quantitative indicators are not sufficiently robust as the replacement of expert review [7]. Our outcome evaluation was also based on the expert review. With the support of the appropriate data of the publication, the patents and so on, we provided the qualitative evidences with the specific and factual description which suggests the impacts on science, technology and socio-economy, which were gathered by the document surveys and the interviews with the experts and the former project members. Thus, our first attempt of the outcome evaluation of the CREST program provided the visibility on the progress in science, technology and socio-economy and was likely to be an effective way in clarifying the research results which had not been seen at the ex-post evaluation. The further development will be required for practical use in the funding activity of basic research.

Opening the black box of technology forecasting. *Byoung Soo Kim, Korea Institute of S&T Evaluation and Planning*

Likewise people are curious about their future, experts are also curious about technological development. As a result, there are a lot of reports about technology forecasting. In the latter of 1950s, technology forecasting was performed by the U.S. military agencies. In the early 1970s, the Japanese government initiated large-scale foresight surveys using the Delphi method, and the surveys have been repeated about every five years. In the Delphi survey, numerous experts are repeatedly surveyed with identical questions, with the results of previous rounds fed back to the

respondents in order to revise their answers and draw out a consensus. Since the latter of 1980s, the technology forecasting activities using the Delphi surveys have pervaded in many other countries. Even though the technology forecasting is pervasively performed as a technology planning activities, merely forecasting results are reported and the process of forecasting remains a black box. The main issue of this study is how technological futures can be forecasted by experts. In the paper, I ethnographically describe the processes of technology forecasting in a technology analysis project in South Korea. The project is mainly to analyze technological level of South Korea comparing to advanced countries such as the United States, Japan, and so on. To analyze the technological level of countries, this project uses the Delphi survey method. In the Delphi survey, there are questionnaires and items of the present and the future level of technologies of the object countries. This study focuses on the converging process of technology forecasting in the Delphi survey. Without any discussion with their peers, experts estimate the level of technologies in the future on the web survey. And without the Mathew effect, they review and revise their estimation of technological future. Their decisions are based on data, information, and previous round's statistical results(inter-quartile range, median, average, and so on). This ethnographic study on the Delphi survey can be useful for opening the black box of technology forecasting and understanding the socially and materially shaping process of forecasting the future.

173. Translating, Understanding, and Applying STS

9:00 to 10:30 am

12: 1222

Participants:

Science as System: Introduction to Science System Theory. *Ryuji Kawayama, University of Tsukuba*

Do you know who Niklas Luhmann is? N.Luhmann is regarded as one of the prominent sociologists who have had an impact even now. He attempted to explain wide-ranging social phenomena in terms of his own Social System Theory. So, his theory presents a point of view that society as self-producing or autopoietic system of communications. His discussion has had a major impact over a wide area; for example, law, economy, education and so on. Many scientific fields probe possible application of N.Luhmann's system theory. As a matter of course, his theory is applicable in science studies because it's a sort of social phenomena. With this concept, science is that one of autopoietic system in society. However, only few attempts have so far been made at science as system in science studies. The purpose of this presentation is to try to show science system theory by N.Luhmann's system theory. Namely, I'd like to propose the new approach that identifies science as one of functional systems in society. Its system has the function that only produces scientific knowledge. Especially, the functional system mentioned just now, that is to say, the concept of functional differentiation provides a starting-point for my proposing theory. We noted a little earlier that functional differentiation. Science system is one of the functional system in society. The new theory is able to cut two ways; macro sociological question how science maintains the division between itself and society, and epistemological issue how it produces scientific knowledge. My idea is a basic theory that provides consistent interpretation of both those issue. The conditions that the speculation of science is independent of constrains of history and social condition are brought by the perspective. And then, the very core of the discussion is that Science system theory would enable us to distinguish precisely between science system and other. In this respect, Science System Theory is able to distinct from Actor-Network-Theory (ANT). Science system theory may be radically opposed to the viewpoint at impossible of identifying science in ANT. But, it's not that the idea contradicts ANT. Both theories would enhance knowledge about the concept of science. Science studies and orthodox sociology of science or scientific knowledge hasn't been enthusiastic about the concepts for a long time. Because they misconstrue the concept of closed system as the concept of literal meaning in autopoietic system theory when the theory says that system is closed. Science system, however, is relation with society and opens to society. It's wrong that this system is completely unaffected by society. For science system is maintained by a difference between science and society. But the system is dependent on environment at the operating level, rather autonomic in working condition. From this viewpoint, we would consider science as system of producing scientific knowledge and structurizing itself. In additon science is put on autonomy and has to go on self-organizing system. For this reason, this presentation is offering fresh insight into science in science studies and sociology of science or scientific knowledge.

How is social science possible after neuroscience? *Kei Yoshida, University of Tokyo Center for Philosophy*

The aim of this presentation is to investigate the problem of how social science is possible after neuroscience. It is increasingly popular to explain human social behavior by using neuroscientific technologies such as functional magnetic resonance imaging (fMRI). We have neuroeconomics, neuropolitics, and neuromarketing, to name a few. But the relation between neuroscience and the existing social science has not yet been fully investigated. If neuroscience alone can explain social phenomena, then social science would be redundant. This is a mere reductionism, which has been harshly criticized in the past. True, reductionism needs to be avoided. But at the same time, it would be inappropriate to exclude neuroscience from explanations of social phenomena, given that human beings are animals and have brains. Then how is neuroscience related to the existing social science? In answering this question, some might try to simply combine neuroscientific findings with the existing social science. But such a conciliatory move does not seem to work well. This is because neuroscience can undermine traditional social scientific ideas. Scholars such as Ernst Fehr, Don Ross, and Stephen Turner respectively argue that social scientific ideas of homo economicus, addiction, and practice are seriously challenged by neuroscience and thus the social sciences based on these ideas need to be modified. Facing this neuroscientific challenge, some might respond that neuroscience is irrelevant to social science. Such a self-defensive move is, however, counterproductive. In this presentation, against conciliatory and self-defensive moves, I shall argue that a neuroscientific challenge to social science suggests an opportunity to revise the existing social science and to explain social phenomena better than ever. Certainly, neuroscience alone cannot explain social phenomena, and it has many theoretical, experimental, and ethical problems to be overcome. But at the same time, it gradually reveals neural underpinnings of human social behavior. Hence while avoiding being too optimistic and enthusiastic, we need to take neuroscience seriously.

On the Technology Risk from the View of STS. *Zhang Ming-guo, STS Institute of Beijing University of Chemical Technology*

The modern risk society is particularly due to the technology risk; the technology risk mainly involves the risk of the technology and the risk emerged from the selecting and using of the technology; the technology risk mostly reflects in the risk of kinds of engineering technology (such as the mining, machining, transporting, communication etc), the risk of the testing technology, and the risk from the selecting and using of the technology (such as various engineering risk); the technology risk primarily comes from the limitation of the scientific cognition, the social and cultural selecting of the technology, the influence of the environment and the value selecting. There could be criticism and reflection of the technology risk from the view of STS as follows: First, the utilitarian invention value of the technology inventor leads to the ignoring of the invented object's risk and make itself the source of the technology risk. Second, as the subject of the market, the social and cultural value influences the selecting and using of some kind of technology, might transferring or enlarging or spreading the technology risk. Third,

during the using of some kind of technology, for the lack of the related testing technology, the evaluating technology and the management, the risk would be enlarged and spread further. Forth, in the course of the transferring of some kind of technology, due to the influence of the nature environment factors such as the climate, geology, temperature and so on, there would be generate some kind of risk which may contribute to failure. There could be control and circumvention of the technology risk from the view of STS as follow: First, the inventor should be life-oriented, should sufficiently estimate the intrinsic risk of the invented object, and should circumvent the risk in the course of investigation and exploitation; Second, improve the related testing technology, evaluation technology and management; Third, people should get rid of the mind control of the utilitarian value and the technological determinism, enhance the education of the duty ethic and the inauspicious sense, establish a new order of the ethic for the individuals and the whole society, to achieve the controlling and the circumvention of the technology risk. The contribution to the document of STS includes: first, have made a research of the major matter of the technology and society in the field of STS with the topic of technology risk; second, have highlighted the view and the character of STS; third, have improved the research of STS and enriched the content of the research of STS.

Philosophy Of/In STS: What STS Can Tell to a Faithful Philosopher. *Olga Evgenevna Stoliarova, State University-Higher School of Economics, Faculty of Philosophy, Department of Ontology, Logic and Theory of Knowledge*

I would like to discuss a complex relationship between the STS field and philosophy from the standpoint of my own experience as a lecturer at the philosophy department who teaches, among others, a course on "A Philosophical Introduction to STS" to philosophy students. There are issues traditionally accepted as philosophical ones: what the world consists of, how can we know that the world is such and such, how should we act in such the world and so on. Ontological, epistemological and normative practical issues are not a subject of STS direct interest because science and technology studies scholars distance themselves as empirical inquirers from speculative judgments. However, philosophy breathes where it wants to, and, I am sure, that the out-of-body position towards philosophy STS proclaims is exactly what can encourage a sensitive philosopher not to hostilities against relativism but to a re-examination of the very philosophical themes. A disciplinary structure of science due to which a highly special place was assigned to philosophy arose from certain lifeworld practices and had certain ideas of the world as its basis and after-effects. Similarly, interdisciplinary crossbreeding and mixing that STS declare and realize also point to (other) kinds of practices and ontological models. Ontologies which are compatible with the fuzziness of disciplinary boundaries glimmer through the STS texture and are one of the main topics I try to discuss with my students in my STS class. Now my questions are the following: what can we say about the world in which an interdisciplinarity and productivity are quite synonyms? What are the "objects" which science and technology studies consider as worthy of being investigated? What are ontological preconditions and implications of STS practices? What happens to philosophy in interdisciplinary academia? STS reference points: Fuller, Steve. 2006. The Philosophy of Science and Technology Studies. New York: Routledge. Daston, Lorraine & Peter Galison.2007. Objectivity. New York: Zone Books. Latour, Bruno. 2005. Reassembling the Social: An Introduction to Actor-Network Theory. Oxford University Press. Pickering, Andrew. 1995. The Mangle of Practice: Time, Agency, and Science. University of Chicago Press. Etc

174. Care: Emerging Transformations

9:00 to 10:30 am

12: 1232

Participants:

How Places Matter. Telecare Technologies and the Transformation of Home and Public Spaces. *Nelly Oudshoorn, University Twente*

In the last 15 years, the healthcare sector has witnessed the testing and introduction of an increasing number of telecare applications. Telecare devices are technologies that enable care at a distance because healthcare actions are mediated by information and communication technologies (ICTs). These technologies imply that patients perform tasks previously delegated to healthcare professionals. The telecare devices for heart patients, investigated in this paper, require that patients make electro-cardiograms (ECGs), take their blood pressure, or measure their weight. These devices discipline patients to inspect their own bodies regularly and to integrate these actions in their daily routines. In this paper I will argue that STS studies of telecare, as well as other technologies, can be enriched by including a focus on place to understand the dynamic interactions between people and things. Adopting insights of human geographers, I will show how places in which technologies are used affect how technologies enable or constrain human actions and identities. This paper thus aims to build bridges between S&TS and human geography by including place as an important element of shaping user-technology relations. Whereas some places may facilitate the incorporation of technologies, others may resist technologies. A focus on how spaces matter is important to understand how telecare technologies reorder and redefine healthcare. Although other healthcare technologies are also important actors in transforming healthcare, telecare technologies do this in a very specific way: they redefine the spatial dimensions of healthcare. Compared to other technology-mediated healthcare practices, geographical distance is integral to telecare. Telecare technologies imply a spatial separation between healthcare professionals and patients in which physical contacts are replaced by virtual encounters. To capture, and further explore, this changing spatial configuration of healthcare, I introduce the notion of geography of care. This concept provides a useful heuristic to study how spaces matter in healthcare. Although telecare technologies introduce virtual encounters between healthcare providers and patients, the use of telecare devices is always situated somewhere. In contrast to the rhetoric on telecare, which emphasizes spatially unbounded care practices, telecare technologies still largely depend on locally-grounded, situated care acts. Based on interviews with users of several cardiac telecare applications, including healthcare professionals and patients, in Germany and The Netherlands, the paper shows how telemedical centres, patients' home, and, in case of mobile telecare devices, public spaces are important places involved in shaping the implementation and use of telecare technologies. And vice versa, telecare technologies play an important role in constituting the new organization of telemedical centres, and redefining the home and public spaces. The central argument of the paper is therefore that spaces still matter in telecare technologies, despite the move from physical to virtual encounters between healthcare professionals and patients.

Demonetizing Culture: Possibilities of Information Systems. *Aneesh Aneesh, University of Wisconsin - Milwaukee*

Popular arguments against the thesis of free culture often hinge on the problem of remuneration. Questions are raised why one would create if there were no remuneration to follow, underscoring the twin problems of motivation and livelihood on psychic and economic planes respectively. Proponents of free culture have provided strong counter arguments, ranging from non-monetary motivations aided by the modularity/granularity thesis of peer production to the problem of permission/licensing culture as detrimental to the creative process. Exploring the logic of information systems methodically, this study develops a broader notion of non-monetary culture, arguing that parts of our creative life and practices of exchange may not be as dependent on the monetary medium as they have previously been. Just as monetization, the invention of modern money by the economic system, brought previously non-economic environments into the economic system (e.g., old-age care), information systems, or what I term algocracies, encourage what we may call the de-

monetization of certain activities with far-reaching implications. As a minor illustration, one increasingly witnesses how a non-monetary practice like barter is making a come back on the web (e.g., Craigslist, 1stHomeExchange, P2P networks, and even eBay). In this context, it is important to separate money-based market systems, hierarchy-driven bureaucratic systems, and code-based algocratic systems, an exercise that allows us to avoid over-applying the monetary model, which assumes that all exchange is dependent on the medium of money in the last instance. The emergence of a new alternative - the medium of code - allows us to start observing situations where cultural capital may not seek conversion into economic capital, and thus, may not need to rely on property relations that sustain economic capital. Three challenges arise from this context: First, how to develop rigorous arguments in terms of the new system without falling back on the language of bureaucratic and market remuneration? Second, how to use algocratic systems to re-invigorate the lifeworld, which has for than a century been colonized by market and bureaucratic imperatives? Third, what sociotechnical decisions may help algocratic systems achieve autonomy and overcome crippling legal controls (e.g., net neutrality is one such movement)? History suggests that whenever there are efforts to stop the differentiation of social systems (e.g., church and the state), it often has pathological social outcomes.

The Politics of Explanation: Moving from Ethnography to Policy. *Antoinette de Bont, ErasmusMC*; *Jessica Mesman, Maastricht University*

Our presentation addresses the ways of ethnographic research can improve the quality and safety of health care. Ethnographic studies have a strong tradition in highlighting the complexities that tend to characterize risky work environments like health care. Both policymakers and managers consider ethnographic studies as a resource for dealing with the considerable challenges they encounter while "implementing" their safety improvements. However, describing the complexities that explain why implementation processes fail is not enough for the ones we study. Over the years interventionist research has become an important portal for 'making a difference'. More and more ethnographers of health care practices aim to go beyond mere description and explanation: they want to change practices as well. In most of these cases intervention is directed at the level they have studied: the daily practice of clinicians. Notwithstanding the fact that we consider these achievements by itself an impressive a crucial step, we would like to stress the need for including the level of policy making as well. If we are to have a real impact we need to do more than simply offer critique of patient safety and move to active engagement with clinicians and policymakers. The challenge for us, as patient safety researchers, is how to translate our ethnographic findings into 'comprehensive' and 'acceptable' input for health care policy and that of patient safety in particular. Interesting, clinicians and social scientists face similar problems. What we see is that interventions that are criticized by clinicians continue to be seen as politically accepted solutions to patient safety. As safety is shaped as an explicit public concern, it becomes part of a regulatory regime in which patient safety is understood as a matter of health care organizations and health care governance. Safety management has become a domain of its own in which medicine is configured as a rule-based practice that solely requires the right guidelines, protocols and performance indicators. This approach to patient safety undervalues the unarticulated and often implicit initiatives and resources in day-to-day clinical practices necessary to fill in the gaps in system design. One major challenge is how to describe the experiences of clinicians with the safety campaigns in a way that is becomes a valuable contribution to the further development of these campaigns. Facing the challenge of opening up opportunities to intervene on the level of policy on basis of ethnographic data requires new strategies and new allies. As long as epistemologies of epidemiology dominate the policy arena, and measurement and reviews are considered as the (if not the only) main style of research, ethnographers will never be able to require both the position and the resources to intervene in health care practice by contributing on the level of policy design. In our presentation we would like to discuss potential strategies to deal with this challenge as to take the next step on the interventionist avenue that the field of STS recently embarked on.

Sense and Sensibility: Affective Labour in Scholarly Collaboration. *Stefan Dormans, Virtual Knowledge Studio for the Humanities and Social Sciences*; *Smiljana Antonijevic, Virtual Knowledge Studio for the Humanities and Social Sciences*; *Sally Wyatt, Virtual Knowledge Studio for the Humanities and Social Sciences*

Traditionally, the academic community has always juxtaposed its own 'sense' with non-academic 'sensibility'. Although it is generally acknowledged that scholarly practices are often far from objective or rational, the image of academic work as exclusively logos-based is still nurtured by many. However, in everyday scholarly work partners for co-operative research and writing are regularly chosen, or avoided, on the basis of institutional and/or individual benefits, personal styles of writing and professional behaviour, and other affective reasons. Moreover, the highly valued institute of blind peer review is effectively rooted in an acknowledgement of the possibility of affect influencing scholars' judgement. In this presentation, we argue that to understand the dynamics of knowledge production more fully, scholarly practice should be rethought and reformulated so as to reflect a wider range of the work of academics. For this purpose, and drawing on recent debates about immaterial and affective labour, we make a heuristic distinction between care work, articulation work, and persuasion work. Care work refers to the work done in looking after our colleagues, our tools, and our outputs. In addition to this understanding of 'care' as 'taking care of', we also use this notion for 'being careful', as scholars often are with their own claims and those of others. Articulation work subsequently entails those practices, both formal and informal, that support the co-ordination of distributed work, while the notion of persuasion work refers to those activities aimed at achieving professional credibility, reputation and position. In order to explore these notions more fully, we focus on two empirical cases about scholarly collaboration in this presentation. The first is an empirical analysis of collaborations of geographically dispersed groups of historians who collect data on specific regions and time periods in order to construct large datasets for international comparative research. The second case builds on reflexive ethnographic approaches and it seeks to make visible our own work practices related to the process of jointly writing a book chapter (under review). The literature on immaterial and affective labour has hitherto neglected scholarly work, despite it being one of the paradigm cases of immaterial labour. In scholarly work, affect is both the outcome and part of the process. For example, producing affect is central to those instances in which scholars aim to persuade others that the phenomenon of their analysis is worthy of investigation and that the proposed methods meet the accepted criteria of validity and reliability. Likewise, affect is central to the whole process of selecting the right partners for a collaboration. As these examples show, affective engagements constitute an inevitable element of knowledge production, both in a positive and in a negative sense. In our view, romanticised and stereotypical narratives, which depict scholars' work as exclusively logos-based, aimed at producing knowledge and bettering the world conceal important dimensions of scholarly work. We therefore argue that academic sensibility should become an equal counterpart of academic sense in analyses of scholarly practice and knowledge production.

Caring and Sharing? Issues on Technological Implementation in Seniors Homes. *Paula Byrne, University of Liverpool*; *Andrew Sixsmith, Simon Fraser University*; *Sonja Muller, Empirica*; *Sarah Delaney, WRC*

The introduction and development of ambient assisted technology (AAT) for senior citizens within Western countries is often constructed in multiple narratives. One narrative is that

technology partly replaces the gaps in traditional family care, where family members look after their elders. Another, is that these technologies reduce costs for social care organisation, as remote monitoring of activities through technologies can highlight instances where carers help is needed. An associated strand in these stories is that caring for the elderly is expensive, for both the state, and for families. Set against this background, and partly in response to market forces, is the rise in the elderly population, we are living longer, with an associated morbidity load, with chronic diseases associated with older age. Many of the current AATs are constructed as safety measures, for example a flood detector in the bathroom. However, there are others which are focused on social aspects of life, such as exercise and nutrition. This paper presents findings from the SOPRANO project (set in seven countries within Europe), where technology has been developed which aims to improve, not only the use, but critically, the acceptance of AAT. AATs provide an interesting discussion for STS, specifically, around the concept of boundary objects (Star and Greisemer 1989). From our work within the SOPRANO project, we suggest there are two, inter-related points for discussion with reference to boundary objects: the gaps between the technical and the social use of AATs; and the control of the data generated by the very use of the technologies. The SOPRANO project has involved users at crucial technical development points to capture their perceptions and acceptance. Nevertheless, the technology remains a translation between the engineers and the users. Additionally, the implementation of the technology resists answering key political points - what happens to the data, who manages it, and how is it interpreted? There is a disjuncture between conception and application, the boundary objects, the AATs are intended to increase acceptance and usability, yet some aspects of their use remains out of the domain of the user. With the increasing development and dependence upon AATs in the context of an aging population, and the ever increasing governance and ethical demands for users to be involved in all aspects of research, such boundary objects require some discussion to negotiate their use.

175. Environment and Sustainability

9:00 to 10:30 am

13: 1312

Participants:

Driving electric vehicles at work: Turn-off or inspiration? *Marit Toftaker, Norwegian University of Science and Technology*

Driving electric vehicles at work: Turn-off or inspiration? Greenhouse gas emissions stemming from the transport sector are at the core of the climate problem as transport accounts for about 19% of global energy use and 23% of energy-related carbon dioxide (CO2) emissions and these shares will likely rise in the future (IEA 2009). To avoid the worst impacts from climate change, global CO2 emissions must be cut by at least 50% by 2050. To achieve this, transport will have to play a significant role. One important strategy to curb emissions from transport is to replace diesel and gasoline cars with electric (EV) and plug-in hybrid electric vehicles (PHEV). This will, according to IEAs Roadmap scenario, contribute to a 30 percent reduction in light duty vehicle (LDV) CO2 emissions by 2050. In the process of technological innovation and implementation the role of the end user is too often neglected. None the less, for the electric car to achieve a large-scale breakthrough, a fundamental change in purchasing and mobility behaviour is crucial. So far (at least in Norway), studies of user experiences with electric vehicles are scarce. Drawing upon the analysis of 'domestication' processes (Sørensen 1996) I will look at the practical, cognitive and symbolic dimensions of user experiences and explore how user patterns are generated, new knowledge about an artifact is appropriated and how meaning is constructed. I will try to understand how the EV is implemented in the work situation, and how user and technology negotiate with each other about the interpretations of use and of meaning. (How) do company employees actually use and reflect upon their use of EV's? (How) does their experience influence their perception of the "usability" of EV's in everyday life? The study will be based on individual and focus group interviews with relevant actors who use EV's for work related tasks on a regular basis, providing important knowledge about the significance of the user in shaping technological implementation and development, and possible future practices regarding EVs.

From Techno-Science Studies to Techno-Ethics: When, Why and How? *Michel PUECH, Sorbonne University, Paris, France*

One of the most important outcomes of science studies is the idea of technoscience (Latour, Hottois, Nowotny). It has proved to be a key operational advantage in philosophy of technology, in order to map and to investigate the networks of inputs and outputs with society. New social concerns are now challenging the existing paradigm. This paper will elaborate on the current challenges in the field of sustainabililty and in some applied ethics research fields. My goal is to show that methods, tools and data coming from technoscience studies are suited to address techno-ethical issues, at least as much as approaches based on meta-ethics or the existing applied ethics paradigms. When is this move required? When ethical and political issues are blocked by remnants of scientism and technocracy (a frequent and frequently unsuspected situation). Why extend technoscience studies to techno-ethics? Because critical thinking in philosophy of technology (Mitcham, Durbin, Borgmann, Winner, Ihde) provides a framework to investigate individual behavior and collective choices implied in the use of technological devices. This framework encompasses value-assessment methods and it is independent of the biased views of science and technology. This paper will give short and significant examples of this critical approach bearing ethical consequences. How is applied ethics to be invigorated by technoscience studies? Carefully minding the risks and not only the opportunities. This ethical step is treacherous in interdisciplinary research. Moreover, the top-down assessment of technological issues by technical experts has shown its limits and there is no chance a top-down assessment by "ethical experts" would do any better. I will give at least one (possibly two or three) case studies to show that the technoscience studies critical approach is a sine qua non condition of ethics concerning a particular technology (e.g. the Web or psychotropic drugs) but gives no prescriptive content. I will argue that this non-prescriptive stance is not a flaw but instead a necessary limit for techno-ethics. Methodology: - assessment of new issues in relation to existing disciplinary fields (including a definition of "technoscience studies") - delineation of 3 or 4 core questions in need of techno-ethics requiring input from technoscience studies; short elaboration of techno-ethical responses; hypotheses on their specific nature. Expected contribution to the STS literature: clarify the current transition in one of the branches of STS from the point of view of both philosophy of technology and applied ethics.

Mongolian celestial burial's cultural connotation and ecological implication. *Jargal non-, STS center, Tsinghua University*

Among all Mongolian burial ceremonies, the celestial ceremony is one bears a longest history. It permeates with a profound cultural connotations and an extremely reasonable eco-great wisdom in spite of the simple operations involved. It is this wisdom, consciously or unconsciously, that used to help maintain the harmony between human and nature and protect the fragile ecological environment. Unfortunately, nowadays the celestial burial of Mongolian has been become a kind of historical memory, accompanied by worsening of the ecological environment Tomb burial and cremation have been the major funerals, while celestial burial is forgotten gradually. Then, why did celestial burial appear in the long process of historical evolvement of Mongolian? What social cultural contents does it contain? (1) Existence of sound and complete food chain is an important ecological guarantee to implement Mongolian celestial burial ceremony. In grassland ecosystem, a complete food chain structure formed between carnivores,

herbivores and grassland resource by interaction of the predators and preys. In the past, existence of numbers of predatory animals in Mongolian Plateau is an important condition to implement Mongolian celestial burial. (2) The production mode of Mongolian grassland nomadism is an important social factor that Mongolian adopts celestial burial ceremony. (3) Mongolian original totem worship and Shamanism are faith bases to implement celestial burial ceremony. "In the patriarchal clan society, the premier faith of Mongolian Shamanism 'empyrean' is closely related to 'wolf totem'". "Wolf is emissary assigned by empyrean to the world." "In accordance with the traditional concept of Mongolian Shamanism, reincarnation of the soul is very important after death." In this process, wolf, the emissary assigned by empyrean to the world and other carnivores are important factors to make the soul of the decedent to go to the heaven (4) In ancient time, Mongolian laws and custom were the social guarantees to implement celestial burial.Mongolian celestial burial ceremony concretely presents ecological wisdom reflected by laws and customs of Mongolian, while these laws and customs are also important social guarantees to implement celestial burial ceremony.
Mongolian Celestial Burial is a concrete manifestation of the Mongolian view of nature. Celestial Burial contains ideas of pursuing harmony between man and heaven. This burial approach on one hand contributes favorable conditions to a complete food chain of grasslands; On the other hand, it avoids the harm caused by other burial forms to the grasslands.
First of all, the Mongolian Celestial Burial provides favorable conditions to the sustainable development of grassland ecosystems. In the grassland ecosystems, carnivorous animals, herbivore and grassland resources form a complete food chain through predator-prey relationship. Celestial Burial is actually a good way to keep the wholeness of food chain and biological diversity of the grassland. Second, the Mongolian Celestial Burial avoids possible harm to the grasslands caused by other burial forms, which give us much inspiration for the development of modern "ecological burial".

Subjugated Knowledges in Urban Policy: A Case Study of Urban Development and Environmental Knowledge. *Fae Dremock, University of Wisconsin, Madison*

With the growth of technological hazards since the end of World War II, scientific knowledges, as Jasanoff (2000) has noted, became essential in discussions of governmental policy. Yet in recent decades, many researchers have documented the increased frequency with which economic "needs" (e.g., development, jobs, infrastructure) override environmental science "concerns" (e,g,. shoreline development, watershed protection, urban heat island effects) in urban policy decisions and in the creation and enforcement of urban ordinances (see, e.g., Collis' 1995 study of Cuba). Economic sociologists have reframed this tension as opportunity for boundary crossing (see, e.g., Biggart & Lutzenhiser, 2007 on energy efficiency). Others have taken such tensions as early markers for interdisciplinary work on approaches to economic sustainability inclusive of environmental concerns (Watson, 2005). But such approaches, although they strongly build perspectives into the economic-environmental tremor lines, do not of themselves question the hierarchical power relation, an important but perhaps less often explicitly addressed area in STS studies. With recent uneasiness in urban economies and the increasing urgency to develop environmental protections, the power understructures that manufacture the thinness and slow pace of integration of environmental findings into urban policy bear closer, and theoretical, examination. To what extent do environmental sciences and knowledges become subjugated knowledges in economic power schemata and remain hierarchically underprivileged outside of their birth networks? To what extent are these knowledges "buried"? To what extent "disqualified"? In what ways are environmental knowledges disempowered as "naive" knowledges that live under the level of required "economic erudition"? In this paper, I examine an urban development project that promised enormous economic benefits from job creation to enlarged tax base, but that also threatened shoreline habitat, the deep aquifer that supplied the city drinking water, and urban greenspace. Drawing from reports, minutes, and televised meetings of city bodies; from developer materials; and from local media coverage, I focus specifically on the ways environmental knowledges were perceived by the developer, the media, the public, and city commissions and councils in order to elaborate on truth-effects of economic discourse in urban policy that make difficult the desubjugating of environmental discourse in the public policy arena.

176. Participation, Representation and Knowledge Brokering

9:00 to 10:30 am
13: 1321

Participants:

Beyond Participation: Sciences, Publics and the Uses of Representation. *Laurent Desutter, Fonds Wetenschappellijk Onderzoek*

Participation has become the political credo of our time. Confronted to controversies related to scientific and technological innovation, decision-makers as well as civil society stakeholders have never ceased to invoke the necessity to increase the level of participation into their legal and political assessment. Such a call for participation is unfortunately misleading. Rather than helping us to get rid of the kind of expert culture which is attached to political decision-making in the field of scientific and technological innovation, it has only served at enhancing a new type of expertise, no less problematic than the former. To scientific expertise must now be added some sort of a "civic" expertise. This new kind of expertise, based on the personal interest and implication of those who possess it, has first appeared as a welcomed contradiction to the monopoly of scientific expertise, and as positive form of political participation. But the participation of stakeholders has become as institutionalized as the one of those who they used to criticize : nowadays "civic" expertise can be considered as an official category within the world of political representation. Since what controversies on scientific and technological innovation have teached us is precisely the necessity to question the structure of political representation, can't we consider such a recognition of the role of stakeholders withing the process of political decision making in this matters, as some kind of a failure ? But, if yes, what new form of representation can we imagine, that will not fall into the trap of stakeholders' participation - that is : of expertise and institution ? In order to reply to this question, maybe is it first necessary to go back to law, and to try to understand what the real - the legal - meaning of representation was, and still is. It is only then that the possibility of inventing radically new ways of public discourses around scientific and technological innovation will again prove viable.

The Role of Civil Society in Environmental and Technological Policy-Making: Some Lessons from Russian Experience. *Dmitry Efremenko, Institute for Scientific Information on Social Sciences, Moscow, Russia*

The paper highlights issues of public participation within the framework of technological and environmental policy. The problem is considered in the context of interrelations between societal actors, experts and policy-makers taking into account common processes of democratic development, its historical aspects, and the level of maturity of civil society institutions. The acceptance-oriented model of decision-making in the political fields mentioned above is characterised as a standard model; as an opposite model the decision-making process under the conditions of a totalitarian regime may be mentioned, where human beings, nature, science, technology etc. are only means to achieve political purposes. Both models as well as transitive forms of environmental and technological policy-making are examined from the point of view of different degrees of citizen participation including mechanisms of plebiscitarian democracy. In order to overcome the weakness of the acceptance-oriented model the principle of acceptability can be substantiated, which is, in essence, a societal reflection turned to normative-ethical,

cultural and cognitive preconditions of acceptance, or a process of mutual learning of societal actors in connection with the problems of environmental and technological policy in the risk society. The second part of the paper discuss the problems of technology and environment policy making in Russia. The specifics of transition from a totalitarian regime to a democracy is especially important in Russia and other post-communist countries. In fact, we are dealing in this case with a long historical process, the first stage of which is a total control of the so-called communist nomenclature over society, and the interim, present-day stage is a prevalence of authoritarian tendencies in the political system. The fall of single-party regimes and ideological dictate, the development of political pluralism, privatisation and diversification of economic activity etc. have led to a substantial transformation of the shape and contents of the policy-making process. Corporative interests are in the foreground at the current stage of social and political development in Russia and many other countries in transition. Under these circumstances the S&T decision-making process can be considered as a searching for compromise between state, societal and corporative actors. Nevertheless the legitimisation of decisions made by politicians is also necessary at this stage. Although the oligarchic and paternalist model of decision-making still prevails, we can see the gradual increase in the importance of social acceptance and taking into account public attitudes.

Scientific governance: A history of scientific citizenship in Sweden before 1977. *Dick Kasperowski, Dept of philosophy, linguistics and theory of science, Gothenburg university*; *Fredrik Bragesjö, Dept. of Philosophy, Linguistics & Theory of Science*

As a culmination of political initiatives, several parliamentary investigations, lengthy discussions and controversies, a new law of higher education and research in Sweden were decided upon in 1977. The new law defined the relationship between university science and Swedish citizens as a project of knowledge dissemination. The methodological approach of this study comprises a combination of archival studies of primary documents and content analysis of secondary materiel pertinent to Swedish research policy and public understanding of science. Attaching a typology of scientific governance (Hagendijk and Irwin 2006) to the recent discourse on scientific citizenship, the present paper focuses on different but coexisting modes of science governance. We arguing, contrary to advocates of the mode 2 metaphors, that there is considerable continuity in scientific governance, extending into the past, long before 1977. In the Swedish context, modes of governance entailed attribution and appropriation of various rights and obligations on the part of different actors concerning their tasks and those of the universities regarding the production of scientific knowledge. Important preconditions are the tensions in Swedish society between a market oriented and a corporatist approach, respectively. In the economic history of Sweden, there is a rich experience of cooperation between labour and capital going back to the beginning of the 20th century. Out of this came the Swedish model for economic development involving intimate interplay between a variety of actors including industry, universities and trade unions with affiliated organisations in civic society, as well as a network of welfare state institutions. In turn, this model generated a specific approach to research policy and public understanding of science. Through the lens of the typology and the concept of scientific citizenship the paper explores the mutual resonance between policy, market and educational arenas. We understand this as a way of managing social order by scientific knowledge. The relationship between citizenship and science during the period under investigation embodies two extremes. On the one hand, state authorities expressed an ambition of creating stability. Through science and research, the political aspirations of citizens tend to be blocked out in contexts of civic unrest, whereas more stable periods reveal greater tolerance by authorities towards political, economic or other interests on the part of citizens. In times of political turmoil, as for example in the beginning of the 20th century or at the end of the 1960s, scientific knowledge and method were the means where by state authorities sought to create a citizen less affected - as "scientific beings" - by political and/or religious influences. Consequently, the educational mode of governance as such has been and remains an important stabilizing factor in Swedish society, where the expert/researcher is held up as the exemplar of a model citizen.

177. Dealing with Risk and Safety

9:00 to 10:30 am
13: 1322

Participants:

Blanket BSE testing and risk analysis: The function of the Food Safety Commission in Japan. *Sho Sekiya, Department of History and Philosophy of Science, Graduate School of Arts and Sciences,The University of Tokyo*; *Yoshiyuki Hirono, The University of Tokyo*

Around the turn of the millennium, food safety administration was reviewed and restructured both at national and international levels, following lessons from the bovine spongiform encephalopathy (BSE) disaster. In Japan, the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Health, Labor and Welfare (MHLW) had previously been responsible for both assessing and managing food risks. In July 2003, the Food Safety Commission (FSC) was established under the Cabinet Office as the assessment agency of food-related risks, separating risk assessment from risk management carried out by agencies such as the MAFF and MHLW. This restructuring of food administration is often referred to as the introduction of risk analysis given that the FCS is institutionally independent from the MAFF and MHLW. According to the definition used by the World Health Organization (WHO) and Food and Agriculture Organization (FAO), risk analysis is a risk-based approach to the management of public health hazards in food, and has three components: risk assessment; risk management; and risk communication (WHO, 1995). A functional separation of risk management and risk assessment was recommended to ensure the scientific integrity of the risk assessment process (FAO, 1997). This paper focuses on BSE safety measures in Japan. Food regulatory agencies are generally perceived as having reduced risk by banning meat-and-born meal, requiring specified-risk material removal, mandating blanket BSE testing and phasing out pithing. However, the efficiency and effectiveness of blanket BSE testing has been debated among scientists. Based on recommendations from the FSC report, the MHLW changed its policy from testing all cattle to only cattle over 21 months of age. Yet, blanket BSE testing was continued for an additional period of three years and subsidized by the government. To maintain consumer confidence in beef, since the term of the national subsidy has ended, blanket BSE testing has continued and costs have been absorbed by local governments. The main objective of this paper is to investigate how the FSC influenced food administration, the food industry and food life in Japan, and to examine how the concept of risk analysis is apprehended, metamorphosed, and actualized. To answer this question, a sector model is employed that includes all four sectors: academic, industrial, private, and public. By surveying the interactions between these sectors over blanket BSE testing, this paper aims to clarify one of the aspects of the mechanisms of food regulation in Japan and the shortcomings of risk analysis framework.

Risk Governance of Nanotechnology - A Social-Ecological Systems Approach. *Arho Toikka, University of Helsinki*

Arho Toikka Department of Social Studies University of Helsinki Nanotechnology - the manipulation and production of materials at the extremely small scale of between 1 and 100 nanometers in at least one dimension - poses important challenges for risk governance. The materials have characteristics and possible effects on human and environmental health that do not exist in bulk size. The product development cycle of nanotechnology is unusual: basic research, research &

development and market penetration are simultaneous, and idea can become a household product in a matter of a few years. The new technology has qualitatively different social, ethical and judicial consequences, and thus needs new responses from the governance system. The paper applies the Social-Ecological Systems (SES) perspective (Ostrom 2009) to the risk governance framework (Renn & Roco 2006; IRGC 2006) to propose a new way of managing an adaptive risk governance system for emerging technologies. A successful governance regime needs to combine diverse inputs from science, economy, political system, as well as society at large, and even more importantly the interactions and interdependencies between these parts. The nanotechnology Risk Governance-SES is a mapping of variables describing 4 subsystems, 2 background systems, 10 between- and within system interactions, as well as 4 feedbacks, one for each subsystem. The main systems are nanomaterials characteristics, nanomaterials production system, governance system and user groups and organized interests, with the general social system and related ecosystems in the background. Each system interacts with each other, and an understanding of these interactions is just as important as an intricate understanding of the systems themselves. The goal is to build a general but adaptable inventory of variables that affect risk governance. The paper contributes to the STS literature by an explicit application of the SES approach to a problem involving science, technology, and policy. Prior applications of the perspective have mostly focused on common pool resources, but the framework is general enough to apply fruitfully to any setting where complex results can be expected to emerge out of a process of self-organization and interdependence. The paper is the result of ongoing work in the project "Nanomaterials in REACH - evaluation of applicability of existing procedures for chemical safety assessment to nanomaterials.", a multidisciplinary project involving researchers in 4 countries, from the natural sciences as well as social sciences. The immediate aim of the project is to refine the procedures of toxicological and ecotoxicological impact assessment in current governance frameworks. Further, the aim is to develop an adaptive governance regime that is able to respond to new technologies and the associated problems. The SES framework is an attempt to build this resilient governance regime. References IRGC. (2006). White paper on Nanotechnology Risk Governance. International Risk Governance Council White Paper. Ostrom, Elinor. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. Science 325: 419-422. DOI: 10.1126/science.1172133 Renn, O & Roco M.C. (2006). Nanotechnology and the need for risk governance. Journal of Nanoparticle Research 8: 153-191

The Social Shaping of Safety: Case Studies in the Japanese Railway Industry and Airway Service. *Takuji Hara, Graduate School of Business Administration, Kobe University*

Managing safety in large technological systems has recently become a matter of urgency, because the potential danger of such systems has become much greater than before, as a consequence of rapid increase in size, power, speed, and complexity. This study argues that the management of safety in large systems should pay attention, not only to enhance the various devices that ensure safety, but also to decrease the potential sources of danger through intentional and institutional restraining of desire. This study is based on the social shaping of technology (SST) approach, which regards every technological phenomenon as consisting of heterogeneous factors including human actors, material entities, and structural and institutional factors. It is assumed that a technological system and the devices that ensure the safety of the system are such heterogeneous configurations. The SST approach has some views in common with the social construction of technology (SCOT), actor-network theory (ANT), and the structurational model of technology. However, the SST approach is not a mere hybrid of these different perspectives. Although the approach is based on the constructive view, it admits that the interpretive flexibility of a particular technology is restricted by material properties of artifacts, and institutional features of social contexts. The study demonstrates the heterogeneity of factors that constitute technological systems, and their safety-securing devices, through case studies of Shinkansen, the bullet train in Japan, and airway control service systems. The history of Shinkansen shows that the benefit of improving safety through the specific configuration of human actors, material entities, and structural and institutional factors tends to be dedicated to increasing speed and/or frequency, in competition with airlines or other transportation services. The history of air traffic control service systems also shows that the improvement of technology increases density of flights under specific economic and social conditions. Such movements enhance the potential risk to these technological systems. Based on these case studies, this paper argues that we should consider avoiding the safety-efficiency spiral more seriously (i.e. the safer the system becomes, the more efficiency is pursued) that potentially increases the risk of catastrophic disasters, under the uncertainty that the dynamics of the heterogeneous configuration inherently pose. This paper contributes to the STS literature partly by advocating the SST approach to the analysis of technological and social phenomena, and partly by pointing out the risk of the recent acceleration of the safety-efficiency spiral under the uncertainty of technology, as revealed by the SST approach.

A new regulatory strategy to deal with the medical isotopes crisis. *marie lavoie, york university*

Abstract: The complexity of emerging issues in science, technology and medicine calls for a new regulatory strategy to deal with risk and uncertainty. This paper explores the production of medical isotopes in Canada as an illustration of complex issues requiring a strategy support system. Tightly but inversely connected, risks generated by either the production or non-production of medical isotopes are located on both the demand (healthy citizens and their well-being) and supply (safety of production) sides. Production goes beyond domestic needs as global society depends upon medical isotopes and relies on very few producers. The challenge for the policy-maker is therefore to reduce the trade-off between the risks of producing versus not producing medical isotopes. With the supply of isotopes, there is a potential risk of contaminating the atmosphere and groundwater as well as valid security concerns. On the demand side, the non-production of isotopes could affect patient care—both in Canada and worldwide—and the medical community. While there are risks for safety and overrun costs related to the production of isotopes, there are also risks for patients who may face more invasive technologies or delays in diagnosis and treatment. This raises the question about the prevalence of the precautionary principle, which could decrease the level of risk on the supply side but leave the demand side with a higher level of uncertainty. The question raised here is about a fair appreciation of risk - at the national and international level - that is, the objectivity of scientists and the realism and flexibility of the regulator considering the level of risk. On the other hand, it is worth wondering if there is a social amplification of risk encouraged by media or the population's generalized "risk-phobia." There is no easy way out of the current crisis.

178. The uses of quantitative methods for qualitative science studies

9:00 to 10:30 am
13: 1331

Although quantitative studies of science have all but disappeared in the sociology of science over the last three decades, they are alive and well. Questionnaire-based studies keep playing a strong role in science policy studies, while bibliometrics constitutes a field of its own. There are good methodological reasons for these separations such as the current microsociological focus of the sociology of scientific knowledge and the near-impossiblity to standardize epistemic properties of research processes. Nevertheless, quantitative methods appear to be an underused resource in social studies of science. Questionnaire-based studies can contribute to finding regularities or to establishing the scope of phenomena that have been identified by qualitative in-depth studies. Bibliometric analyses have

been proven to be very useful in providing information about larger knowledge structures and the ways in which individual research processes are embedded in such structures. Recent trends in the quantitative analysis of sciences to embrace computational approaches for the analysis of large complex networks, and to include new types of data gathered from the web promise a significant extension of the scope and power of these methods. The aim of this session is to bring together researchers who utilize quantitative methods as a resource in their qualitative studies. Instead of exploring the potential of quantitative methods as stand-alone methods in science studies or simply discussing the 'combination' of both types of methods, we would like to focus on the methodological challenges of adopting and exploiting specific quantitative methods in the context of qualitative studies. How can quantitative methods be 'domesticated' for the support of qualitative in-depth investigations? What kinds of contributions can they make? We would like to invite contributions that reflect on the specific problems of integrating quantitative methods (questionnaires, network analysis, bibliometric methods, and others) into qualitative science studies, and demonstrate the potential and methodological challenges involved.

Participants:

Methodological Challenges in STS Raised by R&D Evaluation: Embedding Quantitative Approaches in a Qualitative Design for Evaluation of a Nanotechnology Center Program. *Juan D. Rogers, School of Public Policy, Georgia Tech*

The evaluation of intermediate level R&D entities, such as organizations or programs, requires close attention to multiple dimensions of their context (institutional history, statutory framework, country specifics) leading, in turn, to analogical forms of inference typical of qualitative methods. A basic assumption of standard evaluation frameworks is that the program or entity under examination is phenomenologically well understood so performance measures can be applied and compared with available criteria. In the case of R&D programs and organizations, this assumption is rarely if ever true and the evaluation project becomes an in depth STS investigation that must tie together multiple levels of action and interpretation in order to offer a meaningful assessment of its value. This is generally accomplished with a case study approach that involves qualitative data gathering and analysis. At the same time, the modes of interaction of R&D units with their context given by their scientific activities, output and effects (publications, collaborations, professional mobility, role and position in their field or other fields, interactions with industry and government, among other things) require that the mechanism of R&D performance reported as the result of the case study be situated in a broader field of phenomena. This connection is at the heart of the peculiar intertwining of fact and value that is inherent in R&D evaluation. Several features of these phenomena require quantitative approaches that follow from the questions raised in the case study focus of the evaluation. Sets of publications have peculiar statistical properties, both from the production side (source-token distributions) and the impact side (citations) and both authors and their publications have several network features (collaboration networks, citations networks, subject category networks, and so on), and the aggregate networks themselves have statistical properties given by the underlying probability of entities having links with each other. None of these field level patterns have any inherent performance meaning at the program or R&D organization level (e.g. the normative meaning of specific network structures or of the average number of papers or citations is unclear and/or contested). They only acquire evaluative meaning in conjunction with the case at hand in a complex process of interpretation. This methodological challenge and its specifics will be brought to life in this paper with the actual evaluation of a nanotechnology center program of a US federal agency. The design decisions and methodological set up, leading to the embedding of quantitative methods (bibliometrics, network analyses, interdisciplinarity measures, among others) in a qualitative project will be described in detail and the actual analysis of empirical data will be presented to highlight the intertwining of various levels of factual and value content required for the evaluation. The paper should be of broader interest to the STS community since, on the one hand, the substantive and methodological challenges are shared with many other problems in the field and, on the other hand, R&D evaluation is an active area of inquiry in which "knowledge about knowledge" is at stake.

Scaling-up ethnographies: in search of scientific communication cultures in chemistry. *Theresa Velden, Cornell University*

To acquire a deep understanding of variations in scientific communication cultures between current fields of science, ethnographic methods would seem the method of choice. How do young and senior scientists perceive their intellectual and social research environment; how do they seek out collaborations; how, when, and what information do they share with colleagues and co-workers? And how do these practices shape the use of new Internet-based information and communication technologies to support scientific communication? The challenge remains; how to scale-up ethnographic observations and investigate how local practices affect interaction at the level of an international scientific community - what specific patterns emerge at the aggregate level? Since our focus is on research fields in chemistry and neighbouring areas in physics, we can make use of comprehensive publication databases and construct and analyse co-author networks. The challenge for the interpretation of such networks is ensuring that the abstraction of nodes and links does not obscure underlying real-world processes and does not force comparison onto incompatible entities. Consequently, we have developed an approach that combines ethnographic and recent large-scale bibliometric network analytic approaches to investigate the social and intellectual organization of research specialties. A distinguishing feature of the approach is the iterative use of both methods and the intensive engagement of understanding developed through qualitative research with the quantitative results to further evolve the quantitative analysis. This way we obtain meaningful representations of aggregate patterns and generate new directions of research for our qualitative studies. This work is further evolving approaches in the study of social-intellectual organization of scientific communities such as Crane's (1972) and Zuccala's (2004) research into invisible colleges.

Using bibliometric methods in qualitative studies: Identifying knowledge structures in individual research careers. *Grit Laudel, University of Twente*

The peculiarity of scientific knowledge poses two methodological problems to sociological investigations. The uniqueness of each knowledge production situation renders standardizing approaches useless and calls for in-depth qualitative studies. At the same time, the collective nature of knowledge production processes often makes it necessary to include the wider knowledge structures and knowledge collectives in which a researcher is embedded, which cannot be achieved by qualitative studies. The twin necessities of in-depth analysis and providing collective-level knowledge contexts call for the utilisation of bibliometric methods for qualitative studies. The aim of this paper is to demonstrate the uses of bibliometric methods in qualitative investigations. As examples, I use my projects on academic careers, whose aim it is to establish how national institutions, through creating and modifying patterns of academic careers, shape the content of research. In these projects, I utilise bibliomteric analysis for two purposes. First, I use a bibliometric analysis of interviewees' publication oeuvres for obtaining information about - their status in the scientific community, i.e. the community career (using publication and citation data, co-authorships ..), and - the development of research topics over time, i.e. a researcher's research trail (using bibliographic coupling to find thematic clusters). Second, I utilize bibliometric information for identifying the scientific elite of a research field and for tracking their mobility in order to identify possible interviewees. The presentation focuses on the first application. Shared references in an interviewee's publications (or, in the social sciences and humanities, shared keywords in publication titles) were used to identify clusters of

thematically linked publications. These data can be visualized as a network evolving over time, with clusters representing distinct and sometimes thematically independent lines of research. The network graphs were combined with information on an interviewee's projects and organizational positions as this information could be obtained from the internet. The resulting pictures were presented in the interviews, where they triggered and supported the interviewees' narratives about their research as it unfolded over time. Since the network graphs were also corrected in the interviews, a representation of research biographies that was valid from the interviewee's perspective was constructed in the interview. These representations can be used as 'skeletons' for the reconstruction of interviewees' careers, to which other career-relevant events can be linked. Such a reconstruction enables the identification of researcher's adaptation strategies to institutional condition, e.g. the switching between different lines of projects.

Chairs:

Grit Laudel, University of Twente
Theresa Velden, Cornell University
Jochen Glaser, Technical University Berlin

179. Chronicity and Disability: The Elusive Boundaries between the Normal and Abnormal

9:00 to 10:30 am
5: 511

Social scientists have long recognized that the boundaries between normal and abnormal vary in time and place. But notions such as chronic disease and disability provide new challenges to understanding these variations. Both have evolved over time, been defined in multiple ways, and overlapped in complex configurations. Their increasingly central role as categories of health policy reflect both the expansion of biomedical sciences and the emergence of complex socio-administrative structures that must classify conditions in order to study, treat, manage, or regulate them. This session examines some of the ways these categories have changed over time and varied from one society to the next and among medical specialties and institutions. Particular attention will be paid to the role of emerging scientific disciplines in defining these categories, from epidemiology which played a critical role early in the 20th century, to more recent developments like the emergence of genomics. Psychiatry has been particularly rich in constructing such categories of abnormality, giving them new meanings, and catalyzing resistance to them. Modern cancer treatment has produced yet another boundary category, survivorship, which is not cure, not disease but perhaps a new form of chronicity. While these categories result to some extent from what sociologists like to call "medicalization" the reality is more complex. Not only can they emerge in different arenas (patient groups, administrative bodies, research groups), but their management may be either claimed or rejected by medical or social authorities. Contributors to the session include representatives of several disciplines (STS, sociology, history, and anthropology), working in a trans-national perspective. Together, the papers in this session aim to achieve a richer, more subtle and problematized understanding of these categories and, more generally, of the boundaries between the normal and the abnormal.

Participants:

Technology, disability studies, and the normalization of disability. *Stuart Blume, University of Amsterdam*

For decades, increasingly sophisticated 'assistive technologies' have attempted to correct for the functional limitations of the disabled body. Starting in the 1970s, Disability Studies, emerging as a field principally of social scientific inquiry, offered a competing rendering of barriers to the normalization of people with disabilities. Seeking to shift attention from the limitations of the individual body to those resulting from disabling social practices, Disability Studies has had relatively little to say about technology. In the last few years, the 'social model of disability' has been criticized on a number of grounds, ranging from a lack of policy implications, to a neglect of the embodied consequences of differing impairments. Two issues follow. How far, and under what conditions, can a social science come to influence demarcation processes in which medicine has traditionally enjoyed unchallenged authority? And secondly, can the incorporation of perspectives on technology from STS permit Disability Studies to respond to some, at least, of the critique it currently faces?

From chronicity to "psychiatric disability": French psychiatry and the normalization of long-term mental illness. *Nicholas Henkes, CERMES 3 (CNRS Paris)*

This paper will examine the interplay between science, medical practice, user movements' advocacy and social policy in the negotiation of the boundaries between normality and abnormality in the case of severe mental illness in France. Historically, the notion of chronicity has played a crucial role in shaping mental health systems in western country. Chronics formed the bulk of patients institutionalized in psychiatric hospitals, inhabiting a land beyond hope and out of reach to normal people. Yet chronicity has changed several times in content and in shape during the century. In the 1960s and 1970s the introduction of new drugs as well as the development of new ways of doing psychiatry in community psychiatry setting was such a turning point. Chronic mental illness developed new trajectories. Patients went through multiple hospitalizations between which they had to make their way among a variety of social services and facilities. In this context, one new question emerged: what was the status of these long-term patients. In a way the chronic psychiatric patient had disappeared as a sociopolitical figure, replaced by the homeless, the excluded or the disabled, none of which testified to the specificity of his condition. In the last 15 years, the chronic psychiatric patient has returned to the stage in France, thanks to the emergence of a new notion: psychiatric disability (handicap psychique). While the term itself was not new, it acquired a new visibility when it began to be promoted by family and patients movement and eventually was put at the center of new initiatives in the field of mental health and disability beginning in 2005. As a result psychiatric disability emerged as a very specific construction, reflecting the specificity of both French social policies and the French psychiatric scene. Central to this construction were both new ways of qualifying and representing symptoms of severe psychiatric disorders which insisted on the cognitive dimension of pathological processes, and recognition of the need to rethink the answer to the problems of these persons in their everyday life. In this process both notions of psychiatric disorders and of disability were redefined, based on a reassessment of concepts of temporality, deficit, as well as sociality. What emerged was a new construction of the abnormality of long term psychiatric patients. Based on an analysis of debates and public advocacy around the emergence of the notion psychiatric disability, the paper will thus highlight the complex dynamics of category production in the mental health field.

Work, depression, and disability: Japanese debates regarding the psychopathology of workplaces. *Junko Kitanaka, Keio University*

For people demanding economic compensation for their social distress, biomedical validation of their suffering—such as a PTSD diagnosis for war veterans—has become an indispensable tool and in the process has been creating new forms of biosociality. In this regard, "depression" has recently emerged in Japan as a much-politicized biomedical category used by burned-out workers as the basis for claiming sick leave and economic compensation for their suffering. Increasingly diagnosed as a chronic state, depression is now also being used as a basis for claiming disability status. Japanese psychiatrists have played a pivotal role here by providing powerful testimonies for depressed workers, showing concretely how depression is not only a pathology of the individual brain but is also rooted in workplace conditions. They have thus helped elevate depression to a symbol of collective distress faced by many Japanese in times of economic uncertainty. However, psychiatrists are also being called upon by the government and industry to cultivate a system of psychiatric surveillance and a new science of scrutinizing the psychopathology of work. They have created tools for measuring

psychological stress and monitoring the depressed in workplaces. Psychiatrists are also beginning to reexamine prevailing conceptualizations of individual vulnerability, how best to differentiate those who are "truly" depressed from malingerers, and the causal relationship between social stress and psychopathology. This paper thus examines the nature of this emergent psychiatric "science of work" and its political implications for Japanese debates about the borders of normality and abnormality, health and illness, and the question of how society should deal with individual distress in this time of economic recession.

Epidemiology, chronic disease and disability in the early 20th century; the National Health Survey of 1935-35. *george weisz, McGill University*

The National Health Survey on Chronic Disease undertaken by the US Public Health Service in 1935-36 was up until then, and for decades after, the largest morbidity survey ever attempted. It surveyed nearly 3 million people in 19 states and cost nearly 5 million dollars by the time the last reports were published in 1941. It implemented new survey techniques, and innovated in using public relations as part of the survey enterprise. It ended up as the more or less definitive picture of the state of American health for the next 20 years. In this talk, I pose two questions. 1. Why and how was this survey, unprecedented in scale, undertaken? 2. Why was chronic disease and disability the focus of the survey? In answer to the first, the survey was part of the unemployment relief effort undertaken by the Roosevelt administration but was also part of the long campaign to reform American health care that had been going on for close to a decade and that would continue in the years to come. The men who inspired the survey were veterans of this reform effort. Together Edgar Sydenstricker and I.S. Falk had sought to demonstrate that health conditions in the US were in the wake of the depression terrible, especially for the poor; these conditions required a major over hall of the nation's fragmented health-care system. They also sought to show that the poor bore a disproportionate share of the nation's disease. The survey allowed them to demonstrate this situation amid much publicity and was in fact was used as a major argument for health reform. The focus on chronicity and disability was an outgrowth of some questions that remained from an earlier report by the two men. But a more compelling reason for this focus was that the government-sponsored campaign for healthcare reform was seeking a comprehensive solution to the problems of public health AND of welfare. Welfare reform had since the 1920s been concerned with the chronically disabled who made up a large proportion of the welfare population, which had expanded significantly as a result of the Depression. The focus on chronic illness in the national survey seems to have been a natural outgrowth of the morbidity studies under Sydenstricker's overall direction which evolved as new data emerged from these studies and also from data collected by Federal Emergency Relief Administration on unemployment and disability. Through trial and error, it emerged that data focusing on disability (the inability to work or perform normal tasks) was more dramatic, more easily quantified and thus more precise, and more flexibly interpreted than data about disease incidence. Chronic disease and disability thus became an attractive unit of analysis to demonstrate the poor health of Americans and the vital need for healthcare reform

Chair:

Isabelle Baszanger, CERMES3-CNRS Paris,

Discussants:

Stuart Blume, University of Amsterdam

george weisz, McGill University

180. ICTs, Assemblages, and Management

9:00 to 10:30 am

5: 512

Participants:

Points of Contention: Rethinking the past, present and future of punctuation. *Cecelia Watson, University of Chicago*

My paper outlines a history of punctuation conceived as a technology of communication that was shaped by, and gave shape to, its historical contexts. Most modern style manuals provide prescriptive systems of rules for punctuating a text, and these rules may seem so commonplace that it is hard to imagine that they have a history, that they have not always been standard sources for writers. But rule-based punctuation guides are a relatively recent invention, and the warrant for these rules—that punctuation is derived from syntax and bound by its logic—would have seemed peculiar a century ago: prescriptive rules became popular only in the early 1900s, replacing the descriptive accounts that had been preferred for three centuries prior. The value of understanding this shift in grammatical norms may seem slight at first glance, a subject of interest only to paleographers. On the contrary, when punctuation is contextualized by the history of technology, it can serve to reframe questions in literary theory, legal philosophy, historiography, and philosophy of science. Further, it can yield insight into problems that transcend disciplinary boundaries: it provokes questions about authorship, the use of English as a scholarly language, the transformation of texts as they move online. The history of punctuation forces us to consider how we communicate within the disciplines and beyond them, and how disciplines create and maintain interpretive norms. An account of punctuation that is historiographically nuanced and interdisciplinary in its reach would appeal to multiple disciplines, while remaining rooted methodologically in my own area of specialization, the history of science and technology. Within my field this project has another layer of appeal and significance. In 2005 the Harvard historian of science Steven Shapin called attention to a crisis of readership in the discipline, which he attributed to the growing "hyperprofessionalism" of historians of science. The paper I will present responds to this crisis in two ways: first, by exploiting punctuation's usefulness as an inroad into questions about how scholars communicate with one another within their disciplines and between them; and second, by focusing on a topic—the history of punctuation—in which so many different disciplines have a stake.

Hatsune Miku, Nico Nico Douga, and the Emergence of Web 2.0 User-Creators. *Ryuta Komaki, Institute of Communications Research, University of Illinois at Urbana-Champaign*

This paper looks at an economic and user-generated contents boom that started in 2007 (and still continues on) in the Japanese-language internet sphere around a desktop music software Hatsune Miku. It analyses journalistic and business discourses around the boom from the actor network theory perspective, and presents an argument that complicates the common understanding of the boom itself and the so-called Web 2.0 business model. Hatsune Miku is a desktop music/voice synthesis software produced and sold by Crypton Future Media, a Sapporo, Japan, based company. It uses a voice sampling/voice synthesis engine called Vocaloid 2 developed by Yamaha, and "sings" a song based on scores and lyrics supplied by the users. First introduced in August 2007, this software made a unique success in the Japanese desktop music software market. In addition, the collaborative content creation activities that took place (and still taking place) online generated a new market where enterprises could sell CDs and character merchandises. The success of Hatsune Miku is frequently attributed to video-sharing sites on the internet, in particular to the Japan-based YouTube competitor Nico Nico Douga. This happy synergetic relationships among collaborative web applications, (high quality) user-generated contents and creation of business opportunities may appear to be yet another Web 2.0 success story, a type of narrative that had become commonplace since Tim O'Reilly and his associates coined the business model of Web 2.0. While unquestioning praises and critical assessments (mostly from the political economy perspective) of Web 2.0 abound in popular and academic writings, the reasons and processes through which the "users" become motivated to share, collaborate and create are not adequately discussed by those works. Based on a proposition of

the actor network theory that the roles and characteristics of each actor emerge in time in relation to other actors (human and nonhuman) that constitute a network, this paper looks at a part of the network constructed around Hatsune Miku. It analyzes media representations of the Hatsune Miku boom, as well as advertizing discourses adopted by Crypton Future Media and the development team of Nico Nico Douga at Niwango, Inc., and argues that the motivations and motivating of the user-creators can be understood by looking at how they are recruited to the network. The analysis also suggests that Web 2.0 does not work automatically. Rather, a collaborative environment and the user-creators emerge in relation to a locally and historically specific network, which consists of a heterogeneous assortment of human and nonhuman actors, and rhetorical and technological arrangements, and much conscious (and perhaps unconscious) effort is needed in order for a Web 2.0 business model to run and sustain itself. Besides complicating the commonplace treatments of the Hatsune Miku boom and the business model of Web 2.0, this paper intends to contribute to the growing body of literature that attempts to do actor-network-theory based analysis of economic theories and market activities, heralded by Michel Callon and others.

VIRTUAL WORKLIFE IN RISKMANAGEMENT? 3D onlineVisualisation Technology used in Gas leakage detection in a processplant. *Dr. Berit Moltu, Statoil, Technology and New Energy*; *Thor-Inge Hoddevik, NTNU*

Great interest has been shown to the development and use of different type of virtualisation technology in new workplaces. We see that industry look to the products of gaming industry in developing this type of technology. In our case a Virtual Realitylab and its IT solutions of a gas process plant is developed. The overall object is to mainly use them to validate the risk assessment and training products for an oilcompany by porting and testing them to carry out real-life field tests. In this paper we follow the main actants in an EU reserch - program named VIRTHUALIS in their effort to develop a new virthualisation technology in a process plant in a Norwegian Oilcompany. By the etnograpic method of both following the activity both as an insider and an outsider, as both performing an evaluation and as a researcher, interviewing the main actants as the process goes on, we get a rich empirical acess to the studied phenomena. The technology is not stabilized, freezed and blackboxed before the external researchers finds and are chained with the internal interests and operational work going on in the oilcompany, nomather how "good" or interesting the technology might be. Our study tries to develop to the theory of STS by contributing to the developing and use of the concept of "factish" (Latour 1999:274), as the hybrid mixture of 'fact' and 'fetish' or 'fiction' in the understanding of the different translations that makes the developing of the virtualisation technology. In the process we see "iconoclasts" that tries to break the linkage between facts and fetich or between belief and knowledge. The success of commercialisation of such technology also depends on the success of these actants in the ability to chaining up with common interests, and also the ability to cooperate or compete with competing technologies and programs inside the oilcompany. We see this along the changing of worklife towards a more transparent worklife where developing of new technology plays an important role in blurring of borders between disciplines and departments, between working independent of geographically distance, between managers and employees, and between human and nonhuman etc. here we study the renegotiation of new borders both organisatorically, geographically and by knowledge that takes place in the process of developing and using the virtualisation technology. We ask why this great interest in visualisation and how this is connected to collaboration in worklife, and how this influence knowledge production. This paper discuss how development and use of Virtual visalisation technology can improve operators and managements ability to cope with hazards.

181. Technologies in Public Sphere

9:00 to 10:30 am
5: 513

Participants:

A Dialogue Analysis of Consensus Building Meetings among Experts of Different Disciplines. *Tomoya Shibayama, Waseda University*; *Akira Ohtani, Waseda University*

Public works are decreasing due to the deficit financing in Japan. It is now important to evaluate public works and to choose "really needed public works for citizens". Japanese government offices often hold consensus building meetings between experts and citizens (non-experts) and among experts of different disciplines. In the present study, we analyzed processes to reach agreements in the meeting among them with sound arguments. We used precise records of meetings, which appeared at official's web sites, as qualitative data. Then we applied interpretive approaches. The research question was whether to be able to reach an agreement among experts with different disciplines or not. In this research frame, we adopted Bakhtin's proposal of "authoritative utterances and internally persuasive utterances" (Bakhtin, 1934). This concept was used as reference frame for analyses of discussions among exerts with different disciplines. We analyzed three qualitative data sets. As an example, a river consensus meeting was composed of eight experts for the case of river A. These experts were from eight different disciplines; namely, river engineering, public administration, meteorology, forest hydrology, public economics, rural engineering, conservation ecology, and forest ecology. We got three major results as shown below. 1) A public administration expert and a forest hydrologist translated what a river engineer in the government office explained about "design flood", by using their own technical terminologies. Design flood is an important technical concept in river engineering. Then, the other experts in the meeting understood what the term meant. In other words, the experts in the meeting received the concept of term as internally persuasive utterances. (the case of river A) 2) A forest hydrologist pointed out a lack of notes about forest in a draft report of river public work. A river engineering officer agreed and wrote more about forest in a revised draft report. However the descriptions about forest he wrote was different from the idea of the forest hydrologist. In other words, the officer received what the forest hydrologist pointed as authoritative utterances even for the case that he used a common word "forest". (the case of River B) 3) An ecologist explained her idea about river A by using the words "benefit and distributions". A river engineer in a government office misunderstood her idea. He misunderstood her idea as cost-benefit analysis that was often used in his daily engineering works. In other words, he received her idea as authoritative utterances. These analyses show that experts in the consensus building meeting could understand technical concepts in different disciplines like the case of "design flood". On the other hand, they couldn't correctly understand ideas included in common words like "forest". We concluded that consensus formation among experts with different disciplines is possible by translating what other experts explained by using their own technical terminology. As conclusions, we proposed a manual based on the results of the analysis to manage meetings efficiently. The analytical results and the manual give useful information to the members of society for social studies of science.

Engineering expertise in the case of developing risk assessment for potable water supply to Australia's remote, indigenous communities. *Andrew Chilvers, Dept. Civil Environmental and Geomatic Engineering, University College London*; *Tania Cobham, Arup*; *Sarah Bell, Dept. Civil Environmental and Geomatic Engineering, University College London*

This paper presents initial findings from an empirical investigation into the role of the lead consultant engineers on a project with implications for sustainable infrastructure within the indigenous communities of Australia. A team from the engineering consultancy Arup was commissioned to lead the

development of the National Water Commission project - 'National Risk Assessment, Potable Water Supply for Remote Indigenous Communities'. The objective has been to develop an electronic tool to assist Water Service Providers efficiently gauge and manage drinking water risks in small and remote communities across Australia. This water supply context might be considered highly specific however it still encompasses variant socio-technical needs and risk factors through high intercommunity variance in infrastructural and environmental factors and governance arrangements. The researcher, a trained environmental engineer, entered the Arup offices as participant-observer. Research activity has been to map the processes of project definition and evolution. This was initially achieved through archive analysis and interviewing and, later, through observation and a group exercise in reflection at project close-out. This revealed a process underpinned by the enlistment of networks of knowledge and expertise. Such networks either steered or participated in the processes that defined the meaning and function of deliverables. In plainer terms, knowledge gained from literature reviews and the collation of advice fed into workshops attended by expert consultants from industry, universities and government. Defined by this process, the resultant prototype (with its agreed approach to risk assessment embedded and accompanying guidance material) was trialled through further networks of communities across Australia. The international health community is considering the resultant tool from Australia for application to the assessment and management of potable water supply to remote communities globally. In articulating this specific example of technological development for specific socio-technical contexts in the above terms and with a particular focus on the role of the Arup team of engineers, this paper attends in particular to: *The boundaries evident in the on-going decision-making that defined the project and its resultant tool (with implications for water supply systems in remote indigenous communities). In particular, the boundary between client and consulting expertise in key definitional decisions as well as the various boundaries within the networks of experts, trial participants and the communities themselves; and *The implications of the final approach defined and embedded in the resultant tool for governance and engagement across technical and non-technical boundaries. This paper forms part of the collaborative research project, Engineering Engagement, that aims to investigate the active engagement of the engineer, the business and the profession in reflecting and acting on the influence of the personal, social and political elements of engineering practice. It contributes to the increasingly rich body of empirical studies of engineering practice with an emphasis on the role of consultant engineers. It provides insight into the unique opportunities and constraints on their contributions to sustainable development and socio-technical change.

Why everybody loves nanotechnology. *Johan Mikael Johnasson, University of California, Santa Barbara*

Nanotechnology manipulates single atoms and molecules and has been introduced as the next big thing in science and technology. The new technology has been promised to provide us with cheap energy, better medicines and even to end world starvation. As is the case with new technologies special interest groups always promote them, a concept well documented in the STS literature. This paper will explore through ethnographic and literary studies how different interest groups want to promote nanotechnology for their own ideological or personal gain. Nanotechnology was first found in the realm of utopian and science fiction literature later to be adopted by visionary science policy makers who wanted money for "the next big thing". They in turn influenced politicians to invest vast sums in the new technology. Politian's don't want to be left behind in the technology race seeing a growing high tech industry develop. Nanotechnology also promise a continued industrial growth without the negative side effects on environment, thus being a dream technology for most politicians. Material and electronic scientists, who's work reaches the nanometer scale in the 1990s realize that the new buzzword is nano and starts to add the term in their governmental proposals to get more funding. Ethnographic fieldwork in Sweden and in USA show that the scientists who construct nanotechnology have a "business as usual" approach to their science and does not share the revolutionary perspective on their science. The scientists, although, are aware that they are using the term nano in their advantage to gain more research money. At the turn of the millennium it is discovered that some nanoparticles most likely have adverse affects creating a new market for toxicological studies on nanomaterials. Ethnographic fieldwork among toxicologists shows how they also use nano to channel funding to their research. For the toxicologists it is important to show fund givers that nanoparticles are a complete new set of particles that need to be studied. The term "ultrafine materials", which existed before nanotechnology, are replaced by the term "nanoparticles". The general public only has a vague idea of nanotechnology and environmental NGO's has so far showed little interest in the matter. This may change if nanotechnology may cause a health or environmental scandal in which case the new technology would assist environmental NGO's to gain influence over lawmakers to reach their agenda. Nanotechnology severs several interests. Science policy makers can channel money to the "next big thing" promoting the ideology of continued technological progress for human progress. Politicians see a technology that promise prosperity and continued industrial growth. Toxicologists and material/electrical scientists are happy about the extra funding to their fields. Thus making nano a technology that everybody loves.

Modifying Urban Environments: Providing and Using Ultraviolet Rays in Japan During the Interwar Period. *Boumsoung Kim, Hiroshima Institute of Technology*

According to sociologist Simon Carter, how people thought and acted with regard to sunshine has interacted with societal concepts of health, ethics and beauty. We also could say that the meaning of sunbeams' ultraviolet, or "chemical," rays has been formed and transformed in socio-cultural contexts. In this presentation, which depicts a historical cross section showing how ultraviolet radiation was produced, provided and used to modify Japan's urban environments during the Interwar Period, I would like to consider the relationships among knowledge, technology and society. This story includes sunlight, social problems, electrification, and providers and consumers of artifacts. Electric devices used to produce and control ultraviolet rays, in connection with their varieties in European and American societies, emerged within the social environments of the era. People assumed that tuberculosis, in particular, was problematic in that such contemporary problems as urban pollution and poverty aggravated it. Hand in hand with the emerging knowledge of vitamin D as an anti-rickets measure, ultraviolet rays came to represent "the blessings of sunlight" which industrialized cities lacked. To tackle these social problems, mobilized was technology. Artificial production and control of the "healthy rays" received attention as overcoming geographic, meteorological and societal limits. To providers of electricity or electrical appliances, ultraviolet radiators were a kind of "load builder," a tool for selling electricity. In this presentation, however, I will shed light not only on the providers, but also on the consumers and users, as Ruth Cowan and Trevor Pinch have taught us. In particular, I would like to consider the lay citizens and children, as well as medical doctors and bureaucrats. It would be notable that often the consumers of this knowledge and technology were assumed to be women and/or children; to paraphrase Judy Wajcman, we might find females visible if we look downstream in the process of producing and consuming this invisible radiation.

182. Security and Surveillance

9:00 to 10:30 am

5: 514

Participants:

"Metaprocessing: An STS view of Airport Security". *Victor Marquez, Cornell University*

Abstract The iconic mainstream film "Airport" released in 1969

became an instant international success. In the movie, a desperate and perturbed man wanting to cash a juicy insurance tries to blow up a plane heading to Rome. Carrying a homemade explosive device in his briefcase, we see how the man enters the airport and boards the aircraft without going through any inspection at all. Audiences panicked. Just a few years after Tampa International Airport's scheme would become a new departure point for airport planners around the world in 1971, organized air terrorism stroke for the first time at the aviation industry. Since then hub airports, their policies and the technologies employed for security purposes have shifted our old, romantic affair of flying, into something sadly outdated. As terror moves on, government officials fight back with more complex, expensive technologies; science fiction machines of alarming invasive proportions are about to get implemented. Within this framing, STS scholarship offers a solid opportunity to deconstruct and analyze symmetrically, and eventually bring out some light to, the obscure world of airport security. This paper builds on an ongoing investigation on airport paradigms (which have formed a century of changes in the landside - airside limits and jurisdictions). More specifically, this essay unthreads the intricate network of actors and interests that shape "airport security"; it focuses on the challenges that an ever-growing system poses to designers and on the controversial use of technologies we have made during the last four decades. In this study I make strong emphasis in drawing a distinction between material and immaterial boundaries, and how these concepts affect airport users. In conclusion, I argue that the security frontier embodies a great deal of our current existential concerns, especially in the light of a technologically globalized world. This paper is based partially on a doctoral dissertation research.

A Liberty-Security Trade-Off in Public Policy for the Location Information Technology and Its Implications. *Seah Kim, Graduate Program of Science and Technology Policy, KAIST (Korea Advanced Institute of Science and Technology)*

This paper explores a tradeoff between two major values sought by public policies - liberty and security - with a content analysis of the recent debates on the legislation of regulations on location-based services (LBS) in South Korea. LBS provide an interesting case for studying the contending implications of information communication technologies (ICT) for expanding personal choice and at the same time encroaching upon public security, as it enables tracking individual mobility to an unprecedented degree by utilizing GPS technologies combined with the Internet or mobile services. Based on the content analysis of first-hand materials published between 2002 and 2009 classified along the four dimensions (individual vs. public security, positive vs. negative liberty), this study demonstrates a significant divergence between the public and governmental understanding of the liberty-security dilemma of LBS with Earth coordinate data. Such conflicting perceptions of the potentials and dilemmas of a novel technology like LBS may provide a good contrast with other more established ICTs utilized on telephones, PDAs, computing devices, the Internet, or cell phones. Both the framework and method of the current study yield important implications for studying public policymaking on ICT and other emerging technologies, as they provide a framework to understand how the liberty-security dilemma around novel technologies is conceived and resolved as they evolve into public concerns and policies.

Technology, Search and the status of the Foreign National with Post 9/11 U.S. Trans-national border security. *Mathew Kabatoff, LSE*

Post 9/11 U.S. trans-Atlantic border security can be seen to operate under a policy assumption that views the threat from al Qaeda and its affiliates as catastrophic in nature and generational in duration. Furthermore the U.S. executive branch, namely the Presidency and the Department of Justice have come to regard their engagement with al Qaeda not merely as a conflict or as activity of law enforcement, but as an outright war that justifies both the use of force abroad and the instantiation of emergency procedures regarding surveillance, search and intervention upon foreign national populations at home. This has been evidenced in both the Iraq and Afghanistan wars, and through the creation of the Department of Homeland Security, an agency not only responsible for domestic emergency response but the monitoring of U.S. borders, visa and immigration system through the use of sophisticated biometric and data-mining technology. While the discourse of war asserted by the U.S. executive calls for the ability of the President to act swiftly and with whatever means necessary in the face of the terrorist threat, this notion of unlimited executive power has been made problematic within the United States itself. For instance in 2005 the Bush administration was criticized for directing the National Security Agency to data-mine phone records from the databases of AT&T and Verizon in an attempt to identify calls originating in the U.S. to potential terrorist phone numbers overseas. Where the U.S. executive has had the greatest domestic flexibility in the development of anti-terror provisions however has been in respect to surveillance, search and intervention upon foreign nationals entering the country either as visa holders or tourists. Since the threat from al Qaeda has been regarded as asymmetrical, whereby al Qaeda agents in the planning of the 9/11 attacks were able to disguise themselves as students or legitimate visa holders, a greater amount of scrutiny has been applied to this group or population. Here the security intervention has been performed primarily via increased data gathering on foreign nationals in order to fix their identities, ascertain social networks of interest and to make inferences on future behavior or risk. This paper then will address the legal conditions that enable surveillance, search and intervention upon foreign national populations entering the U.S. as bracketed by the legislative and institutional methods used to protect American citizens. This paper will then conclude that due to the conditions of flexible scrutiny that foreign nationals are placed under - a condition that mixes both law enforcement and intelligence tools - the foreign national is placed in a position that is precarious, due to lack adequate recourse or redress. This paper contributes to the discourse of STS since it addresses the legal and policy conditions concerning the surveillance and search of foreign nationals that has become Post 9/11, heavily reliant on biometric and data-mining technology. The paper then draws a conclusion concerning the implication of the use of such tools.

Consumer Privacy Protection for RFID in the European Retail Sector. *Victor Wanningen, Georgia Institute of Technology*

This paper discusses the emerging application of the radio frequency identification (RFID) technology on individual consumer products in the European retail sector. RFID enables one to wirelessly identify, track, and trace individual entities through an information system. In retail, the application of RFID on pallets, cases, and boxes has already yielded efficiency gains in the business-to-business supply chain. The emerging application of RFID on individual consumer products in the business-to-consumer domain, as the successor of the barcode, further enhances the efficiency of the supply chain management. This new application domain of RFID, however, carries with it the risk of covertly surveying consumers' purchases and movements in and outside the retail store. Hence, the key issue of RFID in the in-store application domain is consumer privacy protection. In this paper, the analysis draws on a conceptual framework of four modalities of regulation: law, norms, market, and architecture, as articulated by Lessig (2004, 2006) and supplemented by Goldsmith & Wu (2006) and Klein (2002). The analysis uses this framework to reinterpret the recently completed case study of consumer privacy protection for RFID in the European retail sector by Wanningen (2009). This case study investigated two RFID pilot projects of the METRO Group, the biggest retailer in Germany, between 2003 and 2009. A consumer privacy controversy at the first pilot project triggered the need to develop regulations for this new application domain of RFID in Germany and the EU. This paper makes the argument that the application of RFID on individual consumer products has 'potential to succeed' when the technical architecture (code) and

the regulatory framework (law, norms) work in harmony to protect consumer privacy. In other words, RFID in retail has a chance to achieve widespread implementation when the value of consumer privacy protection is harmoniously embedded in the RFID architecture (code) and in the regulatory framework of RFID-specific consumer privacy protection regulations (laws, norms). Harmoniously in this context refers to the state of affairs in which the value of consumer privacy protection embedded in code, norms, and law reinforce each other to protect consumer privacy, as opposed to undermining each other. The insights of this paper contribute to STS because they show the need of adequate technology-specific regulations to accommodate an emerging technology that allows for its smooth and successful societal adoption.

Public assessment of new security technologies: beyond the trade-off between privacy and security. *Sara Degli Esposti, University Carlos III Madrid*; *Vincenzo Pavone, CSIC - Consejo Superior Investigaciones Cientícas*

Global threats like international terrorism and transnational organized crime constitute a serious challenge for domestic and foreign security. Although the effective response to these threats remains a contested issue, after 9/11 several western governments have chosen to invest in new technological devices to foster a proactive attitude against terror and crime. Whilst expected to enhance national security, these technologies are subjecting ordinary citizens to an increasing amount of permanent surveillance, often causing infringements of privacy and a restriction of civil rights. According to the traditional economic based approach, people are expected to trade part of their privacy in exchange for the benefits derived from the higher security promised by the security technologies (STs). Two critiques have been moved against this argument. First, this approach reduces people perception on a one-dimensional continuum where security and privacy are exchangeable commodities. Second, the focus on individual privacy obscures the technocratic and political implications of STs. Drawing from the data gathered through the PRISE project, this study contributes to the debate by analysing how the lay public assesses security technologies. Through a composite research design, focus groups are used to grasp people's ways of reasoning and their hidden motivations, whilst the existence of a trade-off between privacy and security is tested through analysis of correlations based on survey data. We come to two main conclusions. First, people do not assess STs in abstract terms but in relation to specific institutional and social contexts. Second, from this embedded view-point, some citizens express concern about government's real surveillance intentions and consider STs as essentially privacy infringing, while other citizens trust political institutions and endorse the adoption of STs to enhance their security. Neither group however, seems to adopt a trade-off approach because concerned citizens see their privacy being infringed without having their security enhanced, whilst trusting citizens see their security being increased without having their privacy affected.

183. Science, Technology and the State: Organization and Practice of Research in State-based or State-Supported Contexts

9:00 to 10:30 am

5: 521

The state is, and has been for most of the latter half of the twentieth century, the primary source of support for research in most advanced industrialized countries, whether in university-based research labs, government labs and institutes, state agencies, mission-based projects or industrial contracts. The relationship between science and government is a classic theme in STS, with extensive scholarship on the way scientific knowledge has served or been harnessed to challenge state power. But although there is now a vibrant literature concerned with the role of science in governance, the relationship between the actual organization and practice of research and the specific state contexts in which research takes place has received much less attention. In this session, we shift the focus to detailed studies of organizational and research practices associated with state-based or state-supported research in order to analyze the influence that the specific state environment, in all its different manifestations, has had on such practices. This session brings together scholars studying the organization and practice of research in several countries, in contemporary and/or historical perspective, in order to address questions such as: What are the issues, constraints and opportunities associated with state-supported research in different countries? How has state support for research influenced the organization of scientific work and practice in specific national, institutional and disciplinary contexts? How have research cultures interacted with state goals, policies and funding regimes? What new forms of organization are associated with state-funded research in different countries? How have state resources and considerations changed ways of organizing and doing research? By bringing together researchers doing ethnographic, qualitative and/or historical studies of research organization and practices in a variety of state contexts, the panel aims to highlight some of the particular issues, constraints and opportunities associated with conducting research in specific cases of state-based or state-supported research, as well as explore some of the commonalities. The session makes a contribution to STS by bringing together papers using a key STS approach, detailed empirical study of practices in context, and explicitly extending that context to include specific state institutions and considerations, in different countries.

Participants:

Of Rubber Plans and Magic Bullets: Soviet Anti-Cancer Drug Development. *Anna Geltzer, Cornell University*

In 1970, the U.S.S.R. was second only to the U.S. in terms of its success record in developing new anti-cancer drugs, with 11 novel original preparations to the U.S.A.'s 19. When considered in light of the fact that the Soviet budget for biomedical research in general and cancer research in particular was a fraction of what was spent in the U.S., this is an apparently remarkable success. Although the success of several Soviet research programs with strategic importance in the Cold War (i.e. space and nuclear physics) has been widely examined, the fact that biomedical research has traditionally been of low priority to the Soviet state has meant that this field largely escaped analytical attention. How do we account for this level of innovation in the context of an organizational system that not only did not offer any of the incentives traditionally thought to be key to its stimulation (for example intellectual property rights), but seemed to be structured so as to effectively discourage innovation? And how do we explain the disintegration of this research program in the course of the 1970s? Drawing on archival research and interviews collected in the course of my dissertation research, this paper undertakes a detailed examination of the organizational structure and practice of Soviet anti-cancer drug development research, paying particular attention to the question of methodology—what constituted legitimate methods of knowledge production, where and by whom were these decisions made, and how were they enforced within the research community. I argue that the systemic problems that confronted Soviet researchers—frequent interruptions in supply of everything from experimental animals to experimental drugs, constraints on sharing information, and lack of coordination of efforts—led to the development of a unique research culture characterized by a surprising level of methodological openness and distinct modes of ensuring scientific excellence. This paper has its origins in a larger project that examines how conceptions of scientific objectivity and subjectivity have changed in Russia from the 1970s to the present as a consequence of the political, economic and cultural transformations that accompanied the collapse of the U.S.S.R.

The Academic Lab as an Organization: Competitive Federal Grants and the Conduct of Research in the Biomedical Sciences in Canada. *Annalisa Salonius, Chemical Heritage Foundation*

The structure of academic labs in the life sciences in both Canada and the U.S. has changed significantly over the last few decades. In the 1960s, the typical academic lab group was small, but today labs are often have twenty or more members, most of them graduate students and postdoctoral researchers. Based on

findings from 78 work history interviews with graduate students, postdocs, technicians and professors in the biomedical sciences done during an ethnographic study of academic labs in the biomedical sciences at leading Canadian research universities, this paper describes the current organization of research, training and publication in these academic labs, and argues that this pattern is relatively new, a response to the constraints and opportunities associated with research funding and its institutional accommodation by universities. This paper builds on an earlier paper, which showed how the emergence of large labs composed mainly of graduate students and postdoctoral researchers in the biomedical sciences in Canada was primarily due to changes in practice of academic scientists due to a shift in the 1980s which made their careers fully dependent on competitive federal funding (Salonius, forthcoming). In this paper, the findings show that the dependence of most contemporary biomedical professors on trainees as research assistants is associated with the full incorporation of trainees' research into the production of faculty research through several institutionalized practices: 1) delegation of the experimental work on projects to trainees as the trainee's main project, 2) sharing scientific credit with trainees 3) informal integration of scientific credit into the structure of training, practices which findings also suggest were not standard in the 1960s and 1970s. The main argument of the paper is the dependence of academic scientists on standard competitive grants means professors in the biomedical sciences must conduct research on a organizational basis (where someone designs the work and then recruits others to carry it out) which under the conditions associated with these grants means delegation of work to trainees. I argue that the current organization of research and training in academic labs with standard competitive grant support in the biomedical sciences can be theorized by extending the use of principal-agent theory, which has been used to describe the relationship between government and science (Guston, 2000) to the lab level, such that the delegation of government funds for projects to scientists, under the conditions associated with standard competitive federal grants, necessitates a second delegation of the work to trainees, something which findings suggest has resulted in significant changes to the structure of graduate training as well as authorship in this field as scientists attempted to align the interests of trainees with their own under competitive grant support.

The Enclosed Language of Collaboration: Practices of "Sponsored Research" around Nano in the United States. *Elena Simakova, Cornell University*

The paper will examine discourses and practices at the university-industry interface in the context of "sponsored research" - an institutionalised way of formalising exchange of resources and knowledge between university scientists and external sources, such as industries, government agencies and foundations, managed by university offices. I will provide a discussion of documentary practices of projects around nanotechnologies in a US university sponsored research office. The data used for this study mainly consist of files containing email exchange, sponsored research contracts and forms used to manage university-industry relations of exchange. The particular focus on documents in this paper aims to examine in what sense the university-industry relations were constituted through the situated practices of creating, reading and interpreting textual artefacts. It also draws on interviews with sponsored research and technology transfer officers. Through examining the contingencies of arrangements and negotiations of sponsored research, the paper aims to interrogate the ways in which technological futures are constituted and managed in the situated discourses of innovation at the university-industry border. The situated practices of sponsored research notably involved the production of conditions under which the negotiations around an individual scientific project would be acceptable for both university and industry representatives, such as sponsored research and non-disclosure agreements. I will discuss various resources employed by participants to establish identities, rights and responsibilities in the course of managing an individual case. The paper will thus examine the construction of collaborative spaces and of content of nano research in a setting involving non disclosure.

Constructing Urban Ecological Governance in Contemporary China: a Case Study in Genealogy of Decision-Making. *Erich W Schienke, Penn State STS*

This paper presents findings from investigations into the rise of ecological governance in China, specifically, in the development of the Beijing Urban Master Plan 2020, and the various, but still failed, attempts at ecocity development. Reasons are numerous for recognizing the importance of China as a relatively unique case in studying relationships between science and governance. Amongst developing nations, China has the most formalized science and technology research institutions, organizations, and infrastructure, and is continually amongst the most prolific nations regarding scientific publications. Chinese researchers are collaborating with many more researchers and institutions outside of the PRC, and are becoming a growing part of the "global" scientific community, i.e. publishing in SCI journals mainly in English. Further, pressing issues ranging from China's environmental problems to improving capacity for innovation continue to present significant challenges for China's leadership. Addressing these and a myriad of other issues will require strengthening Chinese scientific institutions and improving the production of scientific research for use in decision-making contexts. In sum, to address these issues, this paper focuses specifically on the case of urban ecological governance and the relationships it is requiring between science and the state.

Co-Constructing the Cutting Edge: Academic Strength and the Interest-Resources-Skill Convergence. *Leah Nichols, University of Michigan*

Every year the federal government pours significant sums of money into American research universities. The traditional rational for these investments are claims that funding science will lead directly to social benefits. However, the mechanisms that govern the transformation of these investments into the assumed social benefits are complex and poorly understood. A first step toward elucidating these complex processes is to examine the factors that govern which research projects are actually undertaken. Is providing broadly targeted financial resources the best strategy for achieving the government's research goals and scientific priorities? This research elucidates the mechanisms - within the laboratory - that determine which scientific questions are asked and which ones are not. Using a quantitative survey and in-depth interviews, I examine the myriad scientific, economic, personal, social, and cultural factors that academic biologists take into account as they develop their individual research agendas. This paper introduces the concept of Academic Strength as a temporally dynamic positive feedback cycle and as a significant driver of academic research careers. I also posit that the 'Cutting Edge' of science is, in part, defined as the location where the required interest, resources, and skill most easily converge. Funding availability is only one, among many, of the factors that shape which research projects are undertaken. By taking into account the richness and realities of the research decisions made every day by academic scientists, policy makers can develop better targeted and more efficient policies to ensure that society's scientific needs are being addressed.

De-constructing State-supported Research in Brazil: The Evolution of Decentralized Innovation Policy. *Antonio Jose J. Botelho, PUC - Rio; Mariza Almeida, Augusto Motta University*

In the course of the last decade Brazil research productivity accelerated, driven by rising research expenditures. As early as the late nineties, the scale and scope of state-supported research increased, federalist demands to correct regional disparities reached the fore of the science policy agenda. In order to politically sustain the budgetary momentum, the Brazilian state began to decentralize its research policy towards its 26 federative units. These have widely different levels of social and

economic development, research infrastructure and human resources and institutional capacity and arrangement. In fact, in the next moment with the rapid expansion of innovation financing from the passing the 2005 Innovation Law and the renewed claims by the Brazilian federation units to the local nature of innovation, the de-construction of the Brazilian state-supported research deepened. The paper maps and assesses the evolution of a decentralized innovation policy in Brazil, its key mechanisms and main programs, and concludes by discussing its consequences upon the deconstruction of state-supported research. It tracks and analyzes in detail the trajectory and regional institutional impact of two main decentralized policies for university-industry cooperation (PAPPE) and MSME business innovation financing (PAPPE Subvenção). Next, it explores research and innovation State and regional policy learning and the transformation of their structure and governance. It concludes that the rapid rise of innovation policy and the structural and process demands it has imposed upon the Brazilian state have radically altered the form and the function of state-supported research in the country.

Chairs:

Annalisa Salonius, Chemical Heritage Foundation
Anna Geltzer, Cornell University

184. Establishing the Role of Science Communicators in Society: From a Survey of Graduates of a Training Program

9:00 to 10:30 am
5: 522

How can we train and secure skilled science communicators for building up wholesome relationship between science and wider society? Who should take responsibility of such training and how the cost should be charged? Although there has been an emphasis on the necessity of competent science communicators, there are still no clear and definite methods for training. In Japan, the number of science communication specialists is quite limited, and during these few years, some universities, science museums, and other academic institutions in the country set up special programs for training science communicators with strong support by the ministry of education and science. One of them is CoSTEP, Communicators in Science and Technology Education Program at Hokkaido University, which has run one-year course of science communicator training for five years. So far the program produced approximately 300 graduates, and most of them are actively working as science communicators for research institutions, media industries, local governments, NPOs, and so on. The authors of the session, affiliated with CoSTEP as its educational staff, conducted comprehensive surveys aimed at the graduates of the program. When we launched the program back in 2005, we had several hypotheses about the way we can establish science communicators in Japanese society. (1) Learning through community-based practice: Training of science communication would be most effective when the trainees are learning in practical settings. If the training unit is based in a university, it could provide its faculty and staff with service of science communication as by-products of training program, which would help the training program become more sustainable. (2) Science communicator as a "role" in a broad sense: The training program should not focus only on training occupational type of communicators (such as science reporters and interpreters in science museums) because there are not many job opportunities as professional communicators. However, there are plenty of organizations, companies, local communities that need someone who can perform as communicators when necessary. (3) Networking: Training and career development of science communicators can be carried out effectively through collaboration with other organizations both at local and national levels. By analyzing the results of the questionnaire and interview surveys of the graduates, the authors in this session will examine these hypotheses and discuss the possibility and difficulty in establishing the role of science communicators in society.

Participants:

A Case Study on Mutual Relationship among Education, Practices, and Their Modeling in Science and Technology Communication. *Gensei Ishimura, Hokkaido University*

Mutual relationship among education, practice, and their modeling is important to develop science and technology communication. Since 2005, we have run an educational organization to train students specialized in creating bridges between specialists in science and technology and the society (i.e. science and technology communication). We educate students through practices, and we do practices as output of education. Besides, we have reflected our education and practices to abstract models applicable to other occasions in the future. We developed models of teaching method of each class, such as "science writing", "presentation", or "project-based learning", and models of program design of each practice, such as "web communication" or "science café". We also developed the model of our educational program itself, based on reflection year by year. For example, we developed 9 learning modules, where each module is composed of about 3 lectures to systematically cover the broad field of science and technology communication. The model gave us a guideline of how to improve the program for the next year. What's more, we founded an academic journal "The Japanese Journal of Science Communication", which enabled us to widely share the models mentioned above among teachers and practitioners of science and technology communication (mainly) in Japan. The discussion on the mutual relationship among education, practices, and their modeling is supported by the questionnaire and group interview research on our students and graduates executed in the years of 2009-2010.

The importance of providing various people with science communication education at a university. *Ken Saito, Hokkaido University*

CoSTEP is an educational program of science and technology communication at Hokkaido University, Japan. The students consist not only of its graduate students but of general working people. One of the characteristic points is, I think, as follows. Our program is thought to be less directed to education of specific professionals (fixed positions such as science journalists, scientists with communication skills, and so on) than the other universities' programs in Japan. We accept as students a wide range of people: graduate students from different universities, working people with different backgrounds and specialties, even university staff and professors. The variety brings about their mutual stimulation and understanding. In such a situation they can more develop communication skill and collaboration mind. So we would say that these are advantages caused by the variety and less specialization in science communication. It can be interpreted that this program intends to educate science communicators as "roles" rather than as professionals. The roles are expressible with such phrases as "communicators among citizens", "communicators with citizens' standpoint and mind", and further speaking, "popularized communicators". We also expect CoSTEP graduates to play various roles of science communication on their own communities or domains of the society. According to a recent questionnaire result, our graduates think that the most important thing for CoSTEP education is to provide the education services especially for working people outside university. We could say that to do so is one of the social responsibilities of university.

Performing as a Role: a New Perspective of Career Development of Science Communicators. *Naoyuki Mikami, Hokkaido University*; *Yusuke Sato, Hokkaido University*

This paper investigate the possibility of establishing a position of science communicators in society, by analyzing results from a comprehensive follow-up survey aimed at all graduates of science communicator training program at Hokkaido University (CoSTEP). Science communicators are generally associated with certain occupations such as science journalists and interpreters in science museums, but there are not many job opportunities as such professional communicators. In order to increase the number of skilled communicators in society and enhance sound relationship between science and technology and the wider society, science communicator should be viewed as a "role" in a broad sense rather than occupation. With such assumption, CoSTEP accepts people who are eager to perform as communicators in their own fields with a variety of background, and it focuses on practical training which the trainees can adapt

to their own unique situations. According to the results of the follow-up survey, which consists of questionnaires and semi-structured interviews, above 80% of the graduates answered that they utilize what they learned in the program regardless of their types of occupation or field of specialization. In addition, about 40% of them think they have experience significant changes in the way people around them evaluate them after they were trained as science communicators. To summarize the concept of science communicators as a "role" work effectively to nurture "citizen communicators" who can work in various scenes of society.

185. Author Metts Critic: Susan Greenhalgh's "Just One Child: Science and Policy in Deng's China" (Berkeley, University of California Press 2008)

9:00 to 10:30 am

5: 523

Chair:

Catherine Waldby, Sydney University

Panel Members:

Sheila Jasanoff, Harvard University

Adele E. Clarke, University of California, San Francisco

Li LIU, Center for Science, Technology and Society, Tsinghua University

Susan Greenhalgh, University of California, Irvine

186. Building Regulations: Roles of diverse stakeholders in genetic medicine and sciences

9:00 to 10:30 am

5: 524

This session focuses on the roles of various stakeholders in regulation practices in genetic medicine and sciences. As contemporary new genetics and genomic sciences are located in several different fields of academic, clinical, commercial and public worlds, their regulations inevitably involve heterogeneous actors and stakeholders such as scientists, clinicians, patients groups, policy-makers and businesspersons. Our work focuses on the relationships among stakeholders' interests and ideas that are based on widely different norms and standards. In particular, we explore how stakeholders translate and coordinate their work to reach some consensus in diverse settings such as private and public sectors. Our first point is to investigate what kind of stakeholders are involved in the process of regulation practices and why some participate and others not. In order to understand the roles of stakeholders, we propose a comparative approach to different settings, including academic and business, clinic and science, and different countries. By looking into such professional and cultural differences, we hope to identify the overlapping and interactive roles of various stakeholders in regulation practices. The second point is to analyze the institutional frameworks which have impacts on contemporary genetic and genomic regulations. There are various ways of regulating the practices in the field of genetics and genomics, including legal and governmental controls, professional controls, and markets' controls. However, how those diverse stakeholders are working on some consensus for regulations in different fields remains open to questions. We discuss what kinds of approaches are available for different stakeholders. How do researchers conceptualize the ongoing processes? How do different participating stakeholders reach some consensus on regulations? The cases we investigate are limited to Japanese, Chinese, American and European settings, but we welcome discussions from other areas and countries.

Participants:

Regulating both business and science: genetic testing in private and public sectors. *HIroshi Yamanaka, Osaka University*; *Takahiro Ueyama, Sophia University*

Development of commercial direct-to-consumer genetic testing services posed several questions and problems as to the regulation of science, clinic and business practice. We investigate the discussion about the regulation of commercial genetic testing and compare the regulation of genetic testing in the field of science, clinic and business in recent Japanese context. Each of these fields has different norms and standards and has been previously separated from each other. However, the practice of and discussion about commercial genetic testing service brought these worlds closer and urged them to negotiate with each other to have more effective and legitimate regulations thereupon. We interviewed different types of people involved in the discussion such as scientists, clinicians, counselors or businesspersons and analyzed the different interests, norms and standards held by them. Based on qualitative interview data analysis we conceptualize the main differences among different stakeholders. At the same time, we focus on the institutional framework in which the interaction and coordination among different stakeholders take place. Here we deal with four different types of organizations that are involved in the discussion of regulating genetic testing. One is academic professional organization such as The Japan Society of Human Genetics or Japanese Society for Genetic Counseling. Another one is a governmental office like METI (Ministry of Economy, Trade and Industry), MHLW (Ministry of Health, Labor and Welfare) or MEXT (Ministry of Education, Culture, Sports, Science and Technology). The third one is voluntary business group like the Council for Protection of Individual Genetic Information. The last one is an organization that set technical standard procedures for the genetic testing like JCCLS (Japanese Committee for Clinical Laboratory Standards). By looking into what types of interaction and coordination take place in each setting, we like to explore whether the traditional regulation frameworks still work or there is a need for new type of regulation practice.

China and the regulation of genetic testing. *Hui Wen, Osaka University*

In August 2009 Will Frehley, the author of the novel Napoleon in Shanghai" wrote. I predict there will be large-scale prenatal genetic screening programs in China in the next few years. The Chinese are practical people, unconstrained by Western ethics, and so will seize upon any means to advance their familial interests". (http://freewill.typepad.com/genetics/2009/08/genetic-testing-in-china.html) In this presentation I will discuss whether the Chinese are really unconstrained" by any ethical concerns regarding genetic testing and screening programs. My first point is about the relationship between central and local governments in the regulation of genetic testing. While China has so far no central regulatory system on genetic testing except those of prenatal screening, local governments like Shanghai are attempting to introduce an oversight and a regulation on genetic testing. I will analyze the different approaches in central and local governments in this affair. I will also explore how the Chinese experts in this field see the current situation. My second point is about a couple of recent incidents that attracted the attention of both the Chinese and international media as to the social implications of genetic testing. One is the development of the DNA test on kids genetic gifts by Shanghai Biochip Corporation and the program using this test in Chongqing. Another one is "the first genetics-based discrimination charges" against the Chinese local authorities filed by the civil servant candidates who were "denied employment for carrying the genes for Mediterranean anemia." The first case depicts the sensitive and delicate issue relating to the cultural significance of children in China and to the Chinese policy on children. The second case reveals complicated relations between central and local governments in China. In both cases ethical, legal and social issues are arising even in Chinese context. By doing so I would like to show the dilemma the Chinese government faces with regarding genetic testing practices.

Hybrid subject-matters: Regulating predictive genetic testing and assisted reproductive technology in Austria. *Bernhard Hadolt, Department of Social and Cultural Anthropology, University of Vienna*

Complex biotechnologies such as molecular genetic testing and assisted reproductive technologies are not "monolithic" technologies in the sense that they would be clearly delimitated. To the contrary, they are made up by a complex interplay of techniques, bodily materials and functions, machines, substances and procedures. Furthermore, one field of biotechnology may

cross-fertilize and overlap with other fields of biotechnology - as e.g. the connection between assisted reproductive technology, genetic testing, some forms of genetic engineering and stem cell therapy shows. And in addition, being always locally applied biotechnologies are also constituted by local needs, normative believes, economic interests and knowledge regimes. In this way biotechnologies are hybrid subject-matters. Policy making - itself a hybrid undertaking- has to take this hybridity into account. Using preimplantation genetic diagnostics and predictive genetic testing as cases of policy making in Austria since the early 1980ies this presentation looks at how the interrelatedness of fields of biotechnologies with their respective configurations of stakeholders, structural contexts, styles of reasoning and historical processes affects the policy making process and regulatory outcomes.

Beyond ELSA Agenda ——the serviceable STS practice in EGN. *LU lucy GAO, STS Center, student, Tsinghua University; ESRC Innogen Center, Associate , UK*

Research into the ethical, legal and social aspects (ELSA) or Implication (ELSI) of genetics, and later genomics, was originally developed in the context of the Human Genome Project (HGP) .This article will begin from the shaping of ELSA agenda and how the genomics related social science research was influenced by the HGP at the first beginning. As the 'contract' between science and society was bound to be revisited by the large-scale application of genomics research, the boundary of the ELSA agenda was controlled by the leader scientists by determining the boundaries of the funded research. The ELSA research came out to be a problematic one because it operated in a way which locked into a framing that assumed the technology as a given. Through the interviews with the ESRC Genomics Network (EGN) people during the year spent in UK, the author believes that the social scientists' role in UK and their research has beyond the ELSA agenda and new value has been added into the social science research in the post-genomic era. STS approach plays a very important role in the UK life science governance and the practice in EGN shows that the efforts has been made to build a 'serviceable' STS in UK. The social scientists found a way to break down the boundaries between life sciences and social science and engaged themselves into the process of 'science in making'. While the HGP map may tell science where to look it does not say how we should look and therefore what we might find or believe might happen. The serviceable STS may provide answers to the uncertain genomics puzzles and the EGN practices may give us an exaple to do so.

187. Studies on the Co-Construction of ICT and the Gaming Cultures

9:00 to 10:30 am

5: 531

This session seeks to explore the co-construction of information and communication technologies (ICT) and gaming cultures. The session will concentrate on two constitutive dimensions of ICT. First, we will investigate how different socio-cultural backgrounds have shaped diversified trajectories of ICT such as computer game technology, ubiquitous networking, free and open software development, and so on. All the panelist will elaborate on how producers and users effectively create, adopt, and transform ICT in networked practices (both locally and remotely). We will also further discuss how diverse users' identities such as game player's subculture, public perception for safety in ubiquitous networking, free and open software community subculture, and so on, are shaped by ICT co-construction. Second, we attempt to compare the co-construction of ICT among diverse countries such as Brazil, Japan, and Korea in this session. Through debate on these issues, we expect to broaden our understanding of the co-construction of ICT and gaming cultures in a global context. In order to achieve the session's purpose, Sung Won Kim will examine the co-construction of users and ICT in a case of PC bang (PC game room) in Korea. Kim will demonstrate how Korean users, such as the white-collar jobless who were fired from firms after the Asian financial crisis of 1997 and the youth who have enjoyed online game, transform ICT, using broadband internet and online game technology. He will also examine how Korean users' multiple identities are shaped by socio-cultural appropriation of ICT in the period from 1997 to 2010. Arisa Ema will examine the conflict between privacy and safety in the Japanese ubiquitous networking. She will explore (1) what the underlying ideology of the slogan: "anyone, anytime, anywhere and anything," is (2) how the umbrella term "security" can be categorized according to its usage, and (3) how ubiquitous networking technology is co-constructed under the "good" name of security. Luis Felipe R. Murillo will comparatively explore the co-construction of programmers, users, and Free and Open Source Software (FOSS) in Brazil and Japan. He will describe (1) how FOSS was disseminated in Brazil and Japan, assessing FOSS impact on local cultures and ICT infrastructures, (2) what specificities account for local (and remote) public participation in FOSS projects. Young Nam will discuss the construction of game industry in Korea during the 1990s and the 2000s. He will explore how socio-cultural factors influenced the biased development of online game industry in Korea. This session's contribution to STS is several folds. The cross-cultural comparison will help to illuminate the articulation of global and local processes rendered possible by the co-construction of ICT. Also, based on the presenters' contributions, we will be able to further explore convergences and divergences in respect to the ICT co-construction processes, reassessing their impact in diverse local contexts. This session is also intended to promote collaborative scholarship between East and West, Global North and South, as well as diversity in the STS field, bringing together scholars and students from different ethnic backgrounds but similar research agendas.

Participants:

The Co-Construction of Users and ICT in Korea: A Case Study of PC Bang. *Sung Won Kim, Seoul National University*

This paper examines the co-construction of users and information and communication technology (ICT) in Korea through a case study of PC bang (PC game room). In this presentation, I will argue that the PC bang reflects the innovations of Korean users in ICT. Diverse Korean users such as the white-collar jobless who were fired from firms after the Asian financial crisis in 1997 and the youth who have enjoyed online game, transform ICT, using broadband internet and online game technology. In doing so, Korean users have made PC bang become one of the most important nodes in the development of ICT technological system in Korea. The numbers of PC bangs has been increased from 3,000 in 1998 to 21,000 in 2008. The total sales of PC bang also have been increased from hundreds of million dollars in 1998 to nearly US $2 billion in 2008. Through the ethnographic study on PC bang in Korea, I'll raise two questions: First, how do Korean users transform ICT, using broadband internet and online game technology, in the socio-cultural background? Second, how Korean users' multiple identities are shaped in the socio-cultural appropriation of ICT in the period from 1997 to 2010? This paper will contribute to science and technological studies in two ways: First, this paper enables us to understand the social construction of ICT by applying STS approach. Second, this paper will help to explain how ICT is transformed in the local context of Korea.

Ubiquitous Network Society and Security: Case Study in Japan. *Arisa Ema, University of Tokyo*

Ubiquitous network society is the one core strategy that Japanese government aims to realize since 2006. Its goal is to integrate computers seamlessly into the society and enables that anyone can easily access and use a network anytime from anywhere and from any appliance. Recently, many security industries are developing ubiquitous network systems that could collect and transfer more detailed and dense information of people (e.g. children and elder's movement), places (e.g. tourist spot and dangerous area) and things (e.g. commodity and food). Underling connection between "ubiquitous network" concept and security is that the assumption that being connected to someone and something closely enhances one's security. For in real world, having an access or connected to others are valued as "social capital" and ubiquitous network attempts to maximize it effects by employing information technology. Or, it might be rephrased that information and communication technology has its strength in connecting and transmitting information, therefore security industries considered that essence is definitely adaptable for commercializing it as a security service. However, the opposite is

not true: security could be obtained by networking, but creating network does not always assure one's security. Rather it could increase danger by sharing and spreading one's information. In the presentation, I would like to discuss (1) what is underlying ideology of the slogan: "anyone, anytime, anywhere and anything," (2) how umbrella term "security" can be categorized according to their usage, and (3) how ubiquitous networking technology is co-constructed under the "good" name of security, and questions whether those systems actually assures "security." This presentation will contribute to science and technology studies by enriching understanding of a key word "security" in today's computing culture.

Free and Open Source Software Networked Publics: Public Participation and Co-Construction of Information Technologies in Brazil and Japan. *Luis Felipe Rosado Murillo, UCLA*

As central as its constitutive practices of distributed coordination of programming tasks, collaboration, and openness (Kelty, 2008), Free and Open Source Software (FOSS) projects also created an extensive international networked publics that feedback support to collectives of programmers and users. In this paper I perform a comparative analysis of FOSS public participation in Japan and Brazil. Based on ethnographic data, I explore how FOSS is co-constructed by active public engagement in both countries, describing at once convergences and divergences in the constitution of a local network of FOSS developers and users. Brazil and Japan represent polar opposites in terms of access to information technologies (IT) and socio-economic development. Conversely, regarding FOSS dissemination worldwide, Brazil is considered the "shangri-la" of Free Culture, whereas in Japan Open Source was not fully embraced by the general population and the government, although important contributions to international FOSS projects came from Japanese developers. Drawing for theoretical literature on anthropology of technology (Pfaffenberger, 1999; Ingold, 2001), I will discuss the follow questions: how Free Culture and Open Source was disseminated and what was the impact for the local culture and IT infrastructure? What specificities account for local (and remote) public participation in FOSS projects? As a concluding argument, I will elaborate on the necessity of cross-cultural studies of Internet culture, taking into account both remote/online and offline co-construction of information technologies, as well as describing local conditions for the expansion of IT infrastructures and FOSS networked publics.

The Making of Korean Game Industry: From PC Games to Online Games. *Young Nam, Hanyang University*

This study analyzes the evolution of the game industry in Korea during the 1990s and the 2000s. In doing so, it aims to explore motives for the rapid growth of the game industry in Korea and the biased development of the online game industry. The development of the gaming industry in Korea reflects the evolution of technology affected by socio-cultural influences. The government played an important role in the development of the online game industry in Korea. Thanks to the import restrictions against Japanese computer game until the early 2000s, a market for video games and arcade games which comprises the largest part in the world game industry had shaped a relatively small one. The government's building the broadband internet infrastructures had also supported the diffusion of online game in the late 1990s and the early 2000s. Also, the existence of system builders and their solid human networks was an important factor. The few innovators who assisted the breakthrough of the development of the online gaming industry shaped a human network in universities and IT companies. They shared knowhow of innovations and collectively learned the conventions of the industry. In their achievement, the human networks which had been already fully shaped in the late 1990s became more noticeable in the 2000s. Consequently, the game industry in Korea have been changed dynamically within a short period, and in that process, many factors including as technological development and market selection affected that development. Without a clear collective purpose, many actors played their respective roles spurred by their own interests, resulting in a surprising formation of a strong gaming industry in Korea.

Chair:

Sang-yong Song, Hallym University

Discussant:

Tadamasa Kimura, Graduate School of Arts and Sciences, University of Tokyo

188. Bending gendered dualisms of engineering, technology and masculinity: new findings and analytical openings.

9:00 to 10:30 am

5: 532

In this session we present (and invite) papers drawing on recent investigations of different engineering work and experiences to challenge age-old and lingering dualisms in Feminist Technology Studies (FTS). Throughout the history of FTS the strong, pervasive and durable equation between technology and masculinity has been used to explain men's inclusion and women's exclusion in engineering work and education. It has justly been a leitmotif in studies of how and why men have come to dominate engineering. However, the aim of this session is to bend dualisms such as technical-social, hard-soft, male-female, which has followed in the epistemological trajectory of these influential binaries of FTS. In this, we also attend to recent critiques in and of FTS that point to the 'black-boxing' of gender, heteronormative assumptions as well as context-insensitive analyses of gender and technology relations. As this wave of critique has pointed to the limitations of gendered binaries and dualisms, of a taken for granted heterosexuality, and a certain western bias of gender and technology studies, it also directs our attention to methodological assumptions in conjunction with the epistemological points of departure of FTS. These critical interventions in combination with new indicative empirical work compel us to rephrase essential questions of and around gender and technology relations. How has technology been conceptualised? Has the well established gendered dualisms reproduced cultural stereotypes of men and masculinity, women and femininity in engineering? As these formative assumptions are slowly being questioned by new studies we also attend to how alternative measures of inclusion and exclusion has been overlooked, how new and less rigid forms of masculinities emerge as results of strong gender equality discourses weakening the constitutive bond between masculinity and technology. Empirical evidence will also show how an extended perception of technology opens up for more diverse and heterogeneous engineering teams that also include what earlier was perceived as non-technical knowledge.

Participants:

Interdisciplinarity as an instrument of equal opportunities. *Marianne Eidem Fostervold, Norwegian University of Technology*; *Knut H. Sørensen, Norwegian University of Science and Technology*

The paper presents a study of efforts to promote equal opportunities in the Norwegian Highway Directorate. The directorate used to be dominated by engineers, mainly men, and it proved difficult to recruit a sufficient number of women engineers to achieve gender balance among those with management positions. During the last 10-15 years, they have moved away from a knowledge regime centred on engineering competence and engineers' ability to assimilate non-technical knowledge. By extending the concept of technology and introducing a greater emphasis on team-based interdisciplinarity, the directorate has succeeded in increasing its recruitment base for managerial positions through the inclusion of people (women) with a background in social science and landscape architecture. While the women engineers are held in high esteem - more so than men engineers who receive a more ambiguous evaluation - they are no longer the only category of women available for promotion. In this way, the paper suggests that there may be a positive relationship between an extended perception of technology, based on interdisciplinary team-work that includes social science and landscape architecture, and a the provision of better career opportunities for women. In turn, this also dissolves some of the traditional links between technology and masculinity, which used to be pronounced in the directorate.

Revisiting Engineering, Masculinity and Technology studies: Old Structures with New Openings. *Ulf Mellström, Luleå University of Technology*; *Holth Line, Karlstad University*

Within Feminist Technology Studies (FTS) the relation between engineering, technology, and masculinity has been under scrutiny from the early beginnings and formation of the field. In a number of sociological, historical, and anthropological studies (cf. Cockburn 1983, 1985, Hacker 1989, Wacjman 1991, 2004, Faulkner 2000, 2001a, 2001b, Oldenziel 1998, Mellström 1995) the "pervasive and durable equation between masculinity and technology" (Faulkner 2000:3) has been confirmed. The gendered character of engineering work has been conceptualised in dualisms such as technical-social, hard-soft, male-female etcetera. Engineering is interpreted as one constitutive form of masculinity "based on a professional calculative rationality of the technical specialist" (Wajcman, 1991). Throughout the history of FTS the strong material and symbolic relationship between masculinity and technology has been given a significant explanatory value in regard to the exclusion of women in science and engineering. In this paper we revisit these formative assumptions of the conceptual triad of engineering, masculinity and technology in the light of new empirical evidence. In our critical re-reading we also locate our results in relation to recent analytical openings in FTS such as the critique of the 'black-boxing' of gender in gender and technology relations and context-insensitive analyses of gender and technology relations (cf. Landström, 2007; Lagesen, 2005, 2007a, b; Rommes, 2007; Bray 2007, Mellström 2009). Our results walk the line of verifying old findings and indicative new dimensions partly dissolving the inertia of age-old dualisms. These openings are culturally situated within a Scandinavian context of a strong discourse of gender equality and measures around gender equality but can also bear interest beyond the Nordic context. Empirically, the paper draws on contemporary interviews with engineers and engineering students. These observations are matched with other recent empirical investigations of engineering work and education (Fostervold 2009) as well as a critically rephrasing of our previous work in the field (Mellström 1995, 2002, 2004).

Limits of gendered dualisms in analysing the relationship of technology and masculinity. *Bianca Prietl, University of Graz*

This paper focuses on the discursive constructions of technology and gender as it occurred in the self descriptions of contemporary software engineers. Feminist Technology Studies (FTS) have investigated the relationship between engineering, technology and masculinity ever since the formation of the field, unveiling what Oldenziel (1999) called "men's love affair with technology" (9) as socially constructed and historically contingent. Nonetheless, numerous studies have confirmed the "pervasive and durable equation between masculinity and technology" (Faulkner 2003, 3) therewith running the risk of re-producing the cultural stereotype that links technology with masculinity. By analysing engineering and engineering work with the help of gendered dualisms, FTS have contributed to a somewhat limited way of looking at technology. Following this, engineering is predominantly interpreted as an available expression of masculinity that is described as rational, abstract and professional and, most notably, opposed to femininity. Thereby not only differing concepts of masculinity, as demonstrated e.g. in Paulitz (2009), are made invisible but also mechanisms of inclusion of women are overlooked. In this paper, I want to show how dualisms and binary gendered categories, although widely used by software engineers in their self descriptions, reach their limits when employed as monolithic and thereby reductive analysing framework for the relationship between technology and masculinity respectively between technology and femininity. Therefore, I argue that the methodological challenge FTS have to meet are as Lohan/Faulkner (2004) have stated, "to hold on to gender as an analytical category while empirically remaining open to the existence of a diverse range of potentially contradictory gender-technology relations" (323). Subsequently, I will give an outlook on how to possibly handle this methodological problem. Empirically, I'm drawing on semi-structured, in-depth-interviews with male and female professionals in software engineering in Austria.

Chair:

Vivian Anette Lagesen, Norwegian University of Science and Technology

Discussant:

Judy Wajcman, London School of Economics & Political Science

189. Hidden Images of the Nuclear Weapons

9:00 to 10:30 am

5: 533

In August 1945, B29 aircraft dropped two atomic bombs in Japan within three days of each other: a uranium bomb was dropped on Hiroshima at 8:15 am on August 6, and a plutonium bomb originally targeted to Kokura was dropped on Nagasaki at 11: 02 am on August 9. There is much dispute and uncertainties regarding the number of total casualties from these bombs due to "the extensive destruction of civil installations (hospitals, fire and police departments, and government agencies) the state of utter confusion immediately following the explosion, as well as the uncertainty regarding the actual population before the bombing, contribute to the difficulty of making estimates of casualties" according to the Atomic Archive. Moreover, the massive fires that started after the bombings consumed many bodies in both cities. People were present after the bomb all claimed that it took long time to forget the smells of burning bodies after the bomb. One of the report shows that casualties totaled 135,000 in Hiroshima, while the total casualties in Nagasaki was 64,000 (the total populations at the time were 225000 and 195,000 respectively). These numbers do not include foreign citizens and Korean and Chinese people who were brought to these cities and experienced the bombs. Since those surviving victims have died or are dying by various radiation aftereffects including various forms of cancers and autoimmune disease. Since the late 1950s, several movies were made and several books were written on these atomic bombs both in the United States and Japan. Some of them reflect the bomb creators' points of view, while others reflect the victims' points of view. However, there are many stories that still have not been told until very recently. Among those, this panel deals with several key stories: the post atomic bombs lives of Korean and foreigners who happened to become victims of atomic bombs, the censorship of atomic bombs' data during the US occupation period, Japanese scientists' contributions to the study of the effect of bombs, details of the data gathered by the 5th Lucky Dragon Boat hydrogen bomb victims, and finally the breaking of the nuclear weapons agreement between the US and Japan, Treaty of Mutual Cooperation and Security. Four speakers' talks are all based on their archival research on original documents they discovered from the US and Japanese National Archives, the National Academy of Sciences Library and other numerous articles through archival researches of private collection and interviews.

Participants:

Investigations of the Atomic Bomb under the Occupation. *Yukuo Sasamoto, Citizen Science Initiative Japan*

Just before Japan's defeat, the US Military B29 dropped atomic bombs to Hiroshima and Nagasaki. In Hiroshima, immediately after the attack, the Army, Navy and the Imperial Government conducted research into the new weapon. On August 10, the Imperial Headquarters' Commission acknowledged that the new weapon was the atomic bomb. On August 10, a Council in the Imperial presence decided to accept the Potsdam Declaration on the condition that the national polity be allowed to continue. On August 10, Commanding Officer Major General Leslie Groves of the Manhattan Project ordered to form the Manhattan Project Investigation Group into Hiroshima and Nagasaki. On September 14, Brigadier General Thomas F. Farrell of the head of the Manhattan Project Investigation Group returned from Hiroshima to Tokyo. On the same day, the Ministry of Education established the Special Committee for the Investigation to the Effects of the Atomic Bomb of the National Research Council. The government agencies which co-operated with the Special Committee were the Ministries of War, Navy, Home Affairs,

Health andWelfare, Agriculture, Transportation and the Information Bureau etc. The Special Committee, however,had no objectives to provide relief and treatment for the atomic bomb victims. GHQ ordered the Special Committee members to translate their Japanese original reports into English and to submit to GHQ. The reports were forwarded to the Joint Chiefs of Staff in Washington, DC. In the US, the 1946 Atomic Energy Act was effected on August 1. On November 16, the Secretary of the Navy, James Forestall, advised President Harry S. Truman that the Presidential Directive instruct the US Academy of Science—National Research Council to undertake a long range, continuing study of the biological and medical effects of the atomic bomb on man. On November 26, Truman approved the advice. After that the NRC established the Committee on Atomic Casualties (CAC) as the headquarters and the Atomic Bomb Casualty Commission (ABCC) as its field branch in Hiroshima, Nagasaki and Kure (as the control city). On May 3, 1947, the Japanese Constitution was enforced. On August 31, 1948, the Ministry of Health and Welfare established the Atomic Bomb Effect Research Institute in Hiroshima and Nagasaki (ABERI).The institute was the counterpart of the ABCC. It also had no objectives to provide relief and treatment for the atomic bomb victims. I would like to argue in my paper that I once heard from an atomic bomb victim the expression 'the ten dark years', in reference to the period between the beginning of the Occupation and 1957 when the A-Bomb Victims Medical Law (a law relating to the medical treatment of the atomic bomb victims) was enacted. These words are etched deeply on my memory.However, the Japanese Government did not act in the interests of the atomic bomb victims. Thus we see the Japan, itself a victim of the atomic bomb, has taken the first step towards 'becoming a nuclear nation'. This is a historical irony.

Ignored and Forgotten: Korean Nuclear Victims and Survivors in Hiroshima and Nagasaki. *Dong-Won Kim, KAIST*

Two atomic bombs dropped on Hiroshima and Nagasaki killed tens of thousands of Koreans: about 30,000 Koreans in Hiroshima and 10,000 in Nagasaki were killed by the atomic bomb, and another 30,000 Koreans suffered from burns and disease in the aftermath. These numbers indicate that about 1 out 10 nuclear victims in Hiroshima and Nagasaki were Koreans. However, after the end of the Second World War, Korean nuclear victims and survivors in Hiroshima and Nagasaki were ignored and forgotten not only by the Japanese government that had started providing Japanese nuclear survivors with necessary medical treatments since the mid-1950s, but also by both the South and North Korean governments. Many of the Korean nuclear survivors left Japan for their homeland after the end of the war, not realizing that they had been bombarded by dangerously high levels of radioactivity. When these people found that they were seriously ill (burns, cancer, keloids, leukemia, asthma, mental deficiency and birth defects in the second generations), their fellow South Koreans simply ignored them: "Their voices had never been heard. Korean society had given them only neglect and disinterest." Some survivors smuggled themselves into Japan in the 1960s and 1970s to petition the Japanese government for medical treatment, which re-kindled only the Koreans' anti-Japanese sentiments. As the Korean nuclear survivors pass away, the story of Korean nuclear victims and survivors is dying with the time. This paper will analyze how and why Korea's historical, social and cultural background has led Koreans to ignore Korean nuclear victims and survivors for more than a half century.

The Images of Nuclear Weapons in Postwar Japan and Anti-Nuclear Movements in the 1950s. *Masakatsu Yamazaki, Tokyo Institute of Technology*

The atomic bombings of Hiroshima and Nagasaki in August 1945 revealed the most destructive power to-date of man-made weapons. Their impact was so great that Japanese scientists thought that a bigger disaster could be prevented only if war was abolished. Thus they welcomed the international control of atomic energy. It was, however, only after the occupation that the Japanese general public began to learn about the horror of these atomic disasters due to the censorship imposed by the occupational forces. The hydrogen bomb test by the US in the Bikini atoll on March 1, 1954 renewed fears of nuclear weapons. The crew of a Japanese fishing vessel, the Daigo Fukuryu Maru (Lucky Dragon No. 5) suffered from exposure to radiation from the test. Even after the incident the US did not stop nuclear tests which continued to radioactively contaminate fish and rains in Japan. As a result, the petition movement for the ban of nuclear trials suddenly spread all over the country. By the summer of 1955 when the first World Conference against Atomic and Hydrogen Bombs was held, the number of the signatures grew to more than one third of Japan's population at the time. This fact indicated that the anti-nuclear stance was becoming a mainstream view among the Japanese people in the 1950s. Under the strong influence of anti-nuclear Japanese public opinion the Science Council of Japan announced the so-called three principles of atomic energy; "openness," "democracy," and "independence" to ensure atomic energy was used for peaceful uses only. These principles were included in the Atomic Energy Basic Law established in December 1955. With this basic law Japan became the first country that forbade the military uses of atomic energy by law.

The Images of Nuclear Weapons —U.S.-Japan Secret Deals and Japanese Perception of Nuclear Umbrella. *Masaktsu Ota, Kyodo News Agent*

Exactly 50 years ago from now, the U.S. and Japan signed Treaty of Mutual Cooperation and Security and revised their posture of the alliance. Behind this historical event, both leaders agreed to make a secret deal which enables U.S. Navy vessels with nuclear weapons to visit Japanese seaports and pass its water territories without any restriction or consultation stipulated by the new treaty. "Introduction" of nuclear weapons has been one of the most sensitive and volatile issues in the Japanese political and social arenas for the past half-century, due to its broadly-shared public images about such an indescribably destructive nature of nuclear weapons, which was implanted in Japanese people's "DNA" through their unique experiences and unforgettable memories of Hiroshima, Nagasaki and Bikini. These historical backgrounds and Japanese leaders' perception about the U.S. nuclear umbrella provided a special rationale to make the secret nuclear deal with its largest ally, even though they knew that the deal would force them to tell a series of lies to their own constituencies and public. The two countries also exchanged other secret nuclear deals at the time of reversion of Okinawa and Bonin islands in 1960s in order to maintain the U.S. discretion to deploy nuclear weapons for future contingency in the Asia-Pacific region. Based on U.S. and Japanese historical materials and interviews, a new light can be shed on Japanese leaders' image and perception about nuclear weapons and deterrence through analyses of this dark side of the U.S. -Japan relationship.

Chair:

Tomoko Y. Steen, The Library of Congress, Johns Hopkins University

Presenting Authors:

Yukuo Sasamoto, Citizen Science Initiative Japan
Dong-Won Kim, KAIST
Masakatsu Yamazaki, Tokyo Institute of Technology
Masaktsu Ota, Kyodo News Agent

190. Pregnant Bodies: New Technologies, Images, and Discourses (2)

10:45 to 12:15 pm
12: 1212

Participants:

Evidence, trust and distributed cognition: Monitoring the fetus during labor. *Petra Jonvallen, Luleå University of Technology*

Evidence based practices of childbirth involve various types of knowledges and decision-support tools that in combination work

to help decide if an intervention might be needed during the process of labor. Assessing the state of the fetus during labor has, arguably, become increasingly complex during the last couple of years following the introduction of new fetal monitoring equipment. The paper focuses on notions of evidence and trust in an era of evidence based medicine through examining birthing women's, midwives' and doctors' trust in 1) their bodies and decision-support tools, 2) midwifery research and 3) obstetrics research respectively. The concept of distributed cognition is used to denote that knowledge and cognition is not confined to the individual but distributed, between people, objects, and the networks these are part of. Through participant observations in a Swedish childbirth center in 2006, it was found that doctors were portrayed as having trust in a particular fetal monitoring device (STAN) based on obstetric research but that midwives were skeptical, although there were indications that the tendency to use the device in practice, had more to do with age and experience than the assumed gendered character of midwives and doctors. Such a discourse furthermore reinforces a gendered and prevalent dichotomy where obstetric devices are contrasted to (midwives') senses. The paper argues that distributed cognition is useful as a way to get away from such binaries and opens up for a way to understand situated childbirth practices in less dualistic terms. The paper thus examines the relationship between the deployment of a new fetal monitoring device used during labor, and notions of truth/trust among different professionals and patients involved in its use. It further looks at local prerequisites for trust in using the device and how it is connected to the equally local scientific production of objectivity. Local birthing practices and cultures as sites of knowledge production are thus contrasted to the standardized evidence on which fetal monitoring devices are built.

Looking inside doctors consulting room: the construction of menopause during gynecologist's appointments. *Rebeca Buzzo Fertrin, State University of Campinas, Brazil*; *Lea Velho, State University of Campinas, Brazil*

In western societies, menopause marks the beginning of a new phase in a woman's life, bringing with it psychological, biological and social changes. According to the World Health Organization (WHO), the most frequent symptoms - attributed to ovaries producing low levels of estrogen - are hot flushes, vaginal atrophy, mood disturbance, depression, decreased libido, changes in skin texture, osteoporosis and insomnia, among others. However, noticing menopause and its symptoms is not realized in all societies. While western societies seem to face menopause as a phase where there are many losses, which could be related to the extreme social value of the body, youth and beauty, other populations appear to not experience these symptoms with the same intensity or do not even know about this phenomenon. The meaning of menopause, its possible symptoms and search for treatments (hormones or not) can even vary among women from the same country in so far as considering other factors such as social class, race, school level, and access to medical and scientific information. Taking this into account, this study proposes to analyze the way in which menopause is perceived by different groups of Brazilian women, considering the construction of meanings attributed to this phase by doctors and patients in the environment of gynecologists´ consulting room and how this interaction, as well as other social, psychological and cultural factors, can affect the perception of menopause and the therapeutic choices of these women. Therefore, interviews with women patients were conducted, who were from the Menopause Outpatient Facility at the Comprehensive Healthcare for Women Centre, a renowned Brazilian University public hospital. Moreover, observations during gynecologists´ appointments and interviews with gynecology residents and undergraduate medical students, who attended patients at the place, were carried out. From the narratives and what was said during the interviews, as well as observations, it was possible to explore how the meanings of menopause could be constructed/reconstructed inside doctors´ consulting room, leading to profound consequences in the way that women experience phenomena in their own body. The analysis was mainly carried out based on the cultural constructivism approach of scientific knowledge, in which the production of science is understood as the result of internal interactions to society/culture, also considering power relationships in the configuration of this knowledge. Other studies involving topics such as biomedicalization, cognitive authority, nature vs culture and gender relationships help to reinforce the debate proposed in this study.

191. Ecosystems, Conservation, and Perservation

10:45 to 12:15 pm

12: 1213

Participants:

Making Space for Mexican Wolves: Technology, Knowledge and Conservation Politics. *Paula Decker, University of Arizona*

The use of geospatial technologies has proliferated in efforts to reintroduce and conserve wildlife. Radio and GPS collars are being used to monitor and track wildlife, in the hopes that removing nuisance animals will defuse conflicts between wildlife and land users and lead to increased tolerance for endangered species. Problems persist, nevertheless, as these new technologies are adopted, adapted, and learned throughout land management agencies and the general public. Captive-bred Mexican wolves (Canis lupus baileyi) have been reintroduced to the Apache - Sitgreaves and Gila National Forests in Arizona and New Mexico. The project, which involves extensive use of collaring, tracking, and mapping technologies, has not met its goal of 102 wolves and 18 breeding pairs in the wild expected to be achieved by 2006. Illegal shootings and removals of nuisance wolves have likely contributed to stagnated population growth. Additionally, the reintroduction project has been beset by controversy over its management and recent events have precipitated major changes in the project's administrative structure. This paper presents results from research that utilized qualitative methods and GIS - based analysis to answer the question: How is spatialized knowledge constructed by institutional and public actors and represented in particular Mexican wolf policy agendas? Results are interpreted in light of recent work on the co-production of knowledge, space and territory in science and technology studies and the role of non-human actors in shaping social natures in geography and animal studies.

Pragmatic Thoughts and National Park: Boundary of "Satoyama" and National Park System. *Naoki Morishita, Japanese Society for Science and Technology Studies*

The dichotomy by "Preservation" and "Conservation" has been introduced (cf. Passmore, 1974), and numerous studies in terms of environmental thoughts and environmental ethics have them to overcome the conflict (Kito, 1996). In these studies, the Hetch-Hetchy controversy regarded as one of classical issues of confronting these concepts, which is a dam development problem in the Hetch-Hetchy valley in Yosemite National Park in the United States of America. It has been discussed with the confrontation of "Preservation" disputants who denied developing because of the value of nature, and "Conservation" disputants who approved with a utilitarianism viewpoint of the scientific management, development, and use of natural environment (cf. Kito 1996: 46-9). However, the recent researches focus on the real images of an environmental dispute away from the view of such a confrontation. For instance, Shuichi Kito concerned "Stranger" as environmental activists and revealed local politics of environmental dispute where ecological "Stranger" came from outside and intervened to the development to improve the benefit and convenience of people who live in local. There is also an attempt to catch the mechanism of the symbiosis of natural environment and the human society after the model of "Satoyama (Hometown Mountains)," which was a classical land use method of Japan. "Satoyama" was one modality of a phased structure of nature-social structure:

"Okuyama (Remote mountains)", "Satoyama", "Mura (Village)", and "Machi (City)," and "Satoyama" was the artificial space where people had been maintained while jointly managing the resource in specific villages. On the other hand, Environmental Pragmatism denies the dualism of subject and object of recognition, human recognition is not a subject that is outside of the object of nature, arguing that the relationship is always interaction, and all from wildness to urban must be treated as "continuum" (Parker, 1996: 29). Moreover, the idea of "Nature of the Culture" revealed to understand nature as man's composition (Hickman, 1996). Trends of thoughts such as Environments Pragmatism, Kito's "Stranger" Concept, and Classic "Satoyama" concept originated in denying the dichotomy of "Preservation" and "Conservation." Therefore, it is necessary to reconsider the Hetch-Hetchy controversy as an origin of binary conception, and to reexamine discussions in the Hetch-Hetchy Controversy about the ideal National Park System. Hickman, Larry A., "Nature as Culture: John Dewey's Pragmatic Naturalism," in Light, A. and Katz, E., (eds.), Environmental Pragmatism, Routledge, 1996, pp. 50-72. Kito, Shuichi, Reconsidering Environmental Protection: Networks and Environmental Ethics, Tokyo: Chikuma Shobo, 1996. Parker, Kelly A., "Pragmatism and Environmental Thought," in Light, A. and Katz, E., (eds.), Environmental Pragmatism, Routledge, 1996, pp. 21-37. Passmore, John, Man's Responsibility for Nature: Ecological Problems and Western Traditions, London: Gerald Duckworth & Co. Ltd, 1974.

The moral visions of conservation scientists disrupt the hybrid scientific community managing invasive species. *Keith Warner, Santa Clara University*

The controversies surrounding classical biological control are shaped by environmental ethics and human values. From one vantage, releasing natural enemies to novel environments is a narrow, specific and powerful invasive species management practice, but from another, it is the introduction of another invasive organism, fraught with risk of environmental harm. According to many practitioners, the practice of classical biological offers safe, economic, and environmentally sustainable solutions for invasive species control. Drawing from environmental ethics and its concern for protecting the native, conservation scientists critical of this practice charge that it is a form of biological pollution. Debates about biological control have spilled over to regulatory science, and encumbered permit approval. This presentation draws from 140 personal interviews with biological control scientists, regulatory scientists, and conservation scientists critical of this practice. It analyzes the more than 500 peer reviewed articles that have debated the relative safety of this practice. Some have argued that concerns about the unintended negative consequences of BCA introductions have had the perverse outcome of frustrating this form of invasive species management. Views vary by the disciplinary orientation and professional institutional context of scientists, yet it is the moral imagination of many scientists that is the most important factor shaping their ethical judgment on this practice.

The Whaling Controversy as a Global Environmental Conflict. *Bradley Tatar, Ulsan National Institute of Science and Technology*

This paper illustrates that cultural beliefs about the natural environment and humans' relationships to animal species have an impact on scientific research. The international conflict about whaling is not only a cultural conflict between "Eastern" and "Western" societies, but is also a conflict between scientific communities that advocate different approaches to doing research on whales. The scientific research on whales carried out in different countries is shown to be influenced by social movements either for or against whaling, in a politically polarized international context. This paper contributes a case study to the STS literature on the impact of politics on scientific research. Since 1985 when the international moratorium on whaling went into effect, there has been political conflict between Japanese proponents of whaling and "Western" countries opposed to whaling. The conflict politicizes different cultural understandings of food and the natural environment. However, in addition to the political and cultural conflict, scientists have joined the fray. While Japanese scientists collect evidence to argue that whaling can be managed in an environmentally sustainable manner, the Western scientists are using "whale forensics" to analyze the DNA taken from whale meat in Japanese and Korean fish markets. In each case, the existence of scientific uncertainties about the environmental sustainability of whaling permits the scientists to design research that supports their own preferential views on the whaling issue. The scientific programs considered in this paper are carried out in Korea and Japan (pro-whaling) and in the U.S., Australia and New Zealand (anti-whaling). The specific issues tackled by scientific researchers will be explained, to show the basic assumptions built into the research designs. First, the issue of whether or not whales are endangered depends on the definition of "endangered." Does the label apply to a species or a population? While the Japanese have favored the classification of whales as "species," with each species to be assigned a sustainable catch quota, the American scientists have used "forensic" evidence to argue that endangered populations exist within whale species that are not endangered as a whole. Second, differences in research methods are explored. In the case of the Australia/New Zealand research team, emphasis is placed on the development of non-lethal research methods, whereas Japanese scientists rely on autopsy of dead whales. The different research methods are based on different assumptions about the purpose and goals of research on whales. The paper is based on data compiled through interviews. First, interviews with members of pro-whaling and anti-whaling social movements made it possible to identify their assumptions and cultural beliefs about whales and about the natural environment. Second, interviews were carried out with scientists who study whales. Scientists in the U.S., Australia, Korea and Japan were interviewed, and their attitudes are correlated with the existing pro-whaling and anti-whaling social movements.

Understanding wolves in Norway: A dual problem in a dual world. *Håkon B. Stokland, Norwegian University of Science and Technology (NTNU)*

This paper examines state-initiated research following an intense controversy on wolves in Norway the last 30-40 years. About a hundred years after wolves were exterminated in southern Norway, wolves wandering from Russia started to appear once again in the 1970s. During the creatures' absence sheep farmers, hunters, and other inhabitants had developed ways to use and understand the land which were rendered difficult once wolves returned. During the same period, however, environmentalism and conservation had become important aspects of many people's relationship to nature. This led to intense dissension on how to treat the returning wolves, which were only heated when wolf numbers rose significantly in the 1990s and 2000s. Struggling with the situation, politicians initiated much research - conducted by the Norwegian Institute for Nature Research - in order to attain a scientific knowledge base for politics and management of wolves. The research examining the wolf issue is inherently dual, with scientists studying nature (wolves) and social scientists studying society (humans). This arrangement is in accordance with most research on problem complexes involving humans and nature. I will discuss disadvantages of bisecting the wolf issue into separate spheres of study, emphasizing the impact from modern dichotomies such as nature/society, fact/value, science/social sciences and wilderness/civilization. The often incompatible conclusions of the two research groups constitute a political problem in that they confuse and complicate politics. Further, the presumption that nature and society constitutes fundamentally dissimilar phenomena requiring different scientific approaches is questionable. Considering this, I will also discuss problems encountered in a few interdisciplinary projects attempting to unite scientific knowledge on the wolf issue.

"Importance to re-embed local knowledge in river management policy". *Hatsuko Hoyano, Graduate School of Frontier*

Sciences,The University of Tokyo

The framework of Japanese river management policy today is based on the hydraulic engineering, which involves flood control with artificial structures such as banks or dams. It employs a scientific methodology of a mathematical simulation model to convert the amount of flow from the rain precipitation. This kind of scientific framework helps river managers to justify public investment to explan the effects of flood control measures. Yet, too much dependency on scientific and engineering knowledge leads to the consequences that ignore local knowledge and technologies for mitigating floods, and hinders the residents from receiving a variety of benefits from the river basin. In other words, the river management policy today on the basis of scientific knowledge may not be making maximum use of the affluences from the river basin ecosystem, for the sake of protecting the life of the residents. Therefore, this study questions "What are the alternative idea for changing the river management?" In a quest for the answer, it is important to analyze 'local knowledge' as an opposing idea to scientific knowledge. The findings from the case study on Togawa River Basin located in Shimosuwa Town in the central Nagano prefecture, indicate the importance of local knowledge for the river basin ecosystem management. The study on the local history and findings form the interviews of local people tells that there used to be the residents' deep involvement in ecosystem of the river basin with two main dimensions: benefits and risks. They benefitted from the extraction of natural resources like green fertilizer,, irrigation water,, while accepting the risks of natural disasters caused by flooding. The communities knew how to deal with local nature until the modernization in the Meiji Period. Besides, the the basin has been a culturally important place for the communities as a location for offering the sacred trees and carrying out the traditional festival Onbashira-matsuri'of Suwa Taisha. which has been the source of the unity of this region. The case study argues the importance of conventional river basin management among residents that modified its ecosystem balancing between the benefits and risks derived from the basin. Those techniques accumulated from the local experiences should be considered as 'local knowledge' as opposed to scientific knowledge. There is a possibility that local knowledge on river basin management will be revaluated through the concept of ecosystem services of Millennium Ecosystem Assessment. The local knowledge that balances benefits and risks of ecosystem is regarded not as 'trade off' use among ecosystem services, but as a system of comprehensive use of ecosystem services. From the view point of 'local knowledge' revaluated through the concept of ecosystem services, the study proposes the path for the alternative idea of river management, which implies a shift from the heavily dependency on scientific knowledge. Revaluation of 'local knowledge' through the concept of ecosystem services contributes not only to finding the alternative idea of river management, but also to the STS literature.

192. Ethnographic Studies on Boundaries

10:45 to 12:15 pm

12: 1214

tba

Participants:

"If these machines could talk ." Policymaking through Speculation, Interpellation and Expectation. *Ebru Kayaalp, İstanbul Sehir University*

This paper is an ethnographic attempt to understand how institutions that are established under the commitments made to international financial institutions function in developing countries. How are their policies being implemented? Do these institutions work like their counterparts in other countries? Are these institutions and their policies able to constitute the desired "global standards" in national contexts? I try to answer these questions by examining the decision-making process of the Turkish tobacco regulatory board, which was established under the promises made to the IMF in 2002. Deriving from Science and Technology Studies, I investigate the functioning of the regulatory board by focusing on a particular case, i.e. the controversy of the hard-box cigarette packing machines bought for the Turkish tobacco monopoly. The machines' status (whether they were new or used) opened a heated debate among different actors, such as regulatory board, the Ministry of Finance and multinational cigarette companies. The contenders of the dispute invoked several technical reports: the pictures of the machines were taken, the expertise accounts were written, and the different data were circulated but the goal of exposing the "facts" was not achieved. The evidence in the reports and pictures of the machines remained ambiguous, and the machines became the hub of technical as well as political debates. In the end, the lingering dispute about the machines was concluded by the regulatory board with a final decision that was shaped in a process of speculation, interpellation, and expectation. Therefore, in opposition to the idea that policies are being formulated in a structure of rational and well thought-out ideas, I argue that the regulatory agency has developed an improvised version of policymaking hinging upon expectations and speculations. In other words, technocratic policies are formed in an environment of massive uncertainty and ambiguity, rather than coherent, stable, and straightforward systems of global policy and/or national governance. This paper aims at investigating an area at the intersection of Science and Technology Studies and Public Policy though an analysis of policymaking process in a developing country. By focusing on a dispute on non-human actors (cigarette machines), it examines the blurry line between the political and the technical.

How to kill an animal? Science, religion and care in slaughtering practices. *Mara Miele, Cardiff University*

Slaughtering practices are complex, diverse, always messy and largely unknown to the non experts. They encompass animal welfare, freedom of religion and national sovereignty issues in the European Union member states. They have recently gained more prominence in the public debate for the great expansion of the demand for Halal foods, both in Europe and globally, and for the new European regulation about 'The protection of animals at the time of killing' (EC) No 1099/2009 , of 24 September 2009). Article two of this new regulation states: 'Killing animals may induce pain, distress, fear or other forms of suffering to the animals even under the best available technical conditions. Certain operations related to the killing may be stressful and any stunning technique presents certain drawbacks. Business operators or any person involved in the killing of animals should take the necessary measures to avoid pain and minimise the distress and suffering of animals during the slaughtering or killing process, taking into account the best practices in the field and the methods permitted under this Regulation [ ]. In this paper I look at the process of defining 'The best available technical conditions' for killing animals as proposed in the recommendations prepared by a group of experts in veterinary science and representatives of the Shechita and Halal authorities convened in a two days workshop organised within the EU project Dialrel (www.dialerl.eu) in February 2010. From an STS perspective I attend to the different choreographies of killing, - by looking at the heterogeneity of the practices of slaughter, the conventional and the religious ones, and their tools, sites and expert knowledges. I also look at the process of identification of what constitutes 'a humane killing ' within each particular practice, with regard to the different species, the specific locations, amongst specific constellation of techniques and technologies, ideas and tools. And to the different versions of 'caring' enacted during slaughter (caring for the pain experienced by the animal, for the dignity of the animal, care for the religious rules, for the safety of the slaughter man, for the safety of the meat for the eaters). Finally I point to the way in which it all extends beyond the slaughterhouse and how, inevitably, the characterization 'humane' of any practice of animal slaughter remains fragile and contested.

Science, Islam, and Modernity: the Interaction and

Accommodation between the Ideas of Modern Science and Islamic Religion in Malaysia. *Choon-Lee Chai, Red Deer College*

In Malaysia, the search for a developmental model that at once allows for the full exploitation and expression of modern science, and the preservation of traditional culture and Islamic religion remains central to the debate of Malaysian modernity. While the resolution of this tension is not pressing, it remains critical, especially in the minds of Malay Muslims, in how to chart a path of modernization that is unique and distinct from the West (Furlow, 2009). Successful mergers of tradition and modernity have been observed in a few East Asian countries such as Japan, South Korea, Taiwan, and Singapore (Amsden, 2001). Malaysian government has tried to emulate the success of East Asian economies, most explicitly under the Look East Policy by former Prime Minister Mahathir Mohamed (Khadijah Md Khalid & Lee Poh Ping, 2003). However, the accomplishment of modernization and industrialization remains pocketed in Malaysia. While the lack of success can be legitimately attributed to failures of industrial policy, less obvious is the role of cultural adaptation in determining the success or failure of industrialization, or more generally modernization (Mohd Hazim, 2007). The importance of modern science in anchoring the project of modernity in Malaysia is never in question. This lack of questioning, however, is partly because of the perception that modern science is merely a neutral means that is at the disposal of all nations and communities. It is often assumed that the importation and application of modern science can be conducted in parallel with, or even be subjugated to, efforts of traditional, cultural, and religious preservation. However, the introduction of modern science to both Western and Eastern societies has consistently led to the erosion of cultural and religious traditions. This concurs with the general theory of societal rationalization as expounded by Max Weber. That modern science is a value-laden knowledge is evident in the contention that it provides a sacred canopy that is as comprehensive as religion (Drori, et al., 2003). Less obvious, but equally significant, however, is the argument that the influence of modern science can be reversed, as suggested in the Constructivist assertion of the possibility of social conditioning of science, even at the cognitive level. In concrete manifestation, this implies the plausibility of establishing ethno-religious sciences. In Malaysia, modest effort was spent to promote the idea of Islamization of knowledge. Its intellectual root originated from Muslim scholars, the majority of whom were teaching in Western universities. The Islamization of knowledge, especially scientific knowledge, remains a marginal initiative both at the local and international levels. However, the aspiration behind it, and the search for an alternative model of modern development, continues to be a main stay. In this paper, the tension the promotion of modern science and the preservation of Islamic tradition in the context of Malaysia is investigated. The applicability of Max Weber and Jurgen Habermas theories of societal rationalization is critically assessed, and the meaning, and possible construction, of "Muslim modernity" in the face of intense modern scientific developments in Malaysia is clarified.

The efforts to create a knowledge-based economy - the case of Poland. *Jerzy Mamert Bogdanienko, Warsaw University, Faculty of Management*

Science and technology are generally recognized as important strategic factors determining the future development and welfare of nations. The significance of innovation is widely acknowledged in a range of organizations, societies and in global competition. Thus, it is important for companies to develop the ability to lead innovation and to understand what leadership of innovation is all about. The terms "knowledge society" and "knowledge-based economy" have been recently coined in order to bring into relief this crucial role of scientific knowledge and innovation in economic progress and social development. The paper presents a compilation of some science and technology indicators concerning both input and output sides of R&D activities in Poland. The main emphasis is placed on the R&D and innovation statistics. On that background the paper tries to provide a picture of strengths and weaknesses of the Polish science system and its efforts to design a new innovation framework to boost the development of the knowledge-based society in Poland. In order to consider what is the most important to effectively implement innovation culture, these four question are answered: 1. Which is more befitting the situation—radical or incremental innovation? 2. Which field of innovation is more crucial (product, technology, networks, competencies) 3. What are our success criteria—long-term or short-term? 4. What enablers should be included in order for the innovation development to be efficient ?

Map Wars: Politics, Cartography and the Making of the Israeli State. *Christine Leuenberger, Cornell*

The land demarcated by the Mediterranean Sea to the West and the Jordan Valley to the East has been one of the most disputed territories in history. World powers have redrawn its boundaries numerous times. Since the establishment of the state of Israel in 1948, Palestinians and Israelis have disagreed over the national identity of the land that they both inhabit. In the process, different national and ethnic groups have used various sciences, ranging from archeology to history and geography, to prove territorial claims based on their historical presence in the region. This paper explores how geography and cartography become entwined with Israeli politics and territorial claims-making. While before the 1967 war between Israel and its Arab neighbors, there existed a relative consensus within Israel over the country's national contours, after 1967, Israel's expanded territorial control made demarcating its borders ever more controversial. Consequently, various Israeli interest groups and governmental and non-governmental organizations increasingly used various cartographic techniques to forge territorial spaces, delineate disputed boundaries, and inscribe particular national, political and ethnic identities onto the land. Science Studies and critical cartography are used to understand how cartographic representations of Israel/Palestine constitute a form of visual rhetoric that serves to make knowledge-claims and communicates certain social and political concerns.

193. Science and Leadership

10:45 to 12:15 pm

12: 1222

Participants:

Leadership in Scientific Research Groups. *Edward Hackett, Arizona State University*; *John Parker, NCEAS/UCSB*

"Telling someone what to do is taboo. The greatest man in science cannot tell the lowest what to do." A biologist interviewed by Warren Hagstrom , 1965: 106 "I'm in charge of this lab. It has to be that way in science. You can't do science in a democratic way because it has to be one way of thinking, maybe the wrong way of thinking, but it has to be one line." A biologist interviewed by EJH, 2000 Science is becoming increasingly collective and collaborative, a trend that was first noticed by Max Weber (1918), amplified and elaborated by Derek Price (1983), and that appears to be accelerating in the present (Hackett, 2005 [intro]; Wuchty, Jones, and Uzzi, 2007). Varied forces drive this trend: specialization, interdisciplinarity, expensive or complicated equipment (such as particle accelerators), interstitial research questions, applied ("real-world") problems, and the rise of the corporate university. Whatever the cause, the consequence is that leadership has become increasingly important for scientific performance. In this paper we first draw upon literature in organizational behavior and management to outline the general challenges of leadership in groups, then use interview and observational data from published and unpublished material to explore how well such principles apply to an understanding of leadership in scientific collaborations. The paper will contribute by (1) examining whether and in what ways leadership in scientific collaborations differs from other forms of leadership; (2) describing how scientists negotiate the conflicting demands of leadership in

science; (3) proposing a framework for studying scientific leadership. Methodology This paper is based on extended, face-to-face interviews with scientists in various fields and at various career stages, supplemented by approximately 100 hours of observation of scientific collaboration in working groups organized by the U.S. National Center for Ecological Analysis and Synthesis in Santa Barbara, CA.

Empirical Images of scientists, their representational systems, and their joint development: implications for the design of learning environments in science. *Jose A Torralba, University of Hawaii, Curriculum Studies*

A recent development in K-12 science and mathematics instructional design has been the emergence of temporally extended curricular activities generally described as project-based learning (Thomas, 1990). Among educational researchers efforts to examine project-based learning emerged as part of mounting criticisms about a dissonance between what was learned in schools and what constituted mature disciplinary knowledge, or what should be learned in order to understand and practice a discipline. Some referred to this problem as the 'encapsulation of school' (Brown, Collins, & Duguid, 1989; Engestrom, 1991). In this paper I argue that part of addressing this problem involves capturing images of activity inside places where scientific and mathematical notions are the means of solving problems scientists deem as relevant. Those images can better guide the design of learning environments in which students and teachers can have a clear sense of the [everyday] working of science; without these images progress with project-based curriculum will be limited to superficial effects on the current and future engagement of students in the sciences. The purpose of this paper is thus to develop an empirically based framework of scientific practices that can inform science curriculum design efforts. Such framework is constructed using data from a three-year ethnographic study of a scientific project, and encompasses the type of contexts and leading activities that take place inside a scientific laboratory. Working under this framework, the paper offers a curricular instrument (a matrix) that could help us speculate about ways in which mature scientific practice can inform science curriculum design.

Roles Played in Scientific Controversy: The Attempt to Revive Ampèrean Electrodynamics. *Allan Olley, University of Toronto*

The attempt to understand the closure of scientific controversy is an old problem in social studies of science, made prominent by researchers like Harry Collins. The practice and meaning of dissent against orthodox science is another popular and politically charged subject. In this paper I examine the case of Peter Graneau, who in 1982 reopened a debate that had been settled decades earlier in electrodynamics. In a short note in Nature Graneau discussed an experiment that he claimed demonstrated the existence of longitudinal forces along the direction of electrical current flow. These forces had been a part of Ampère's theory of current put forward in the 1820s. By the late twentieth century Ampère's law had been superseded by the Lorentz force law and Maxwell's laws of electro-magnetism. Graneau's claims met with strong rebuttals by more orthodox physicists, but he continued a decades long project to demonstrate the superiority of Ampère law. Graneau continued to uncover phenomenon he considered at odds with received electrodynamics and that argued for his own position. Graneau was not only cited by opponents, but also found some supporters and others who cite use his work for their own purposes. In my talk I will show how Graneau and those who cite his work play certain social roles and how those roles are reinforced or eroded by social forces within the institutions and culture of science. I will also show how scientific institutions and practice both discourage and encourage dissent in complex ways. My method in this work is to study the citation pattern of Graneau and those who site him and the character and rhetoric of their published work.

Emergence of a scientific collaboration: DataONE case study. *Arsev Umur Aydinoglu, University of Tennessee*

Problem The developments in science and technology have given the ability the researchers to tackle more complex problems, such as climate change; however, such complex problems demand collaborations not only between researchers of the same discipline but also across disciplines. This paper presents a descriptive case study of information and communication behaviors of such a transdisciplinary collaboration: DataONE (Observation Network for Earth), a collaboration between earth environmental scientists, computer scientists, librarians and information scientists in order to develop an organizational structure that will support the full information life-cycle of biological, ecological, and environmental data and tools to be used by researchers, educators and the public at large. Methodology Case study methodology is used in many disciplines and provides in-depth, longitudinal information about a single instance, event, or episode (Yin, 1984). This case study will focus on the 'emergence' of the collaborative DataONE partnership. Through semi-structured interviews with the leadership and cyberinfrastructure team, information and communication behaviors will be examined. The unit of analysis is the individual researchers in the collaboration. Complexity theory is going to be employed to study the emergence of the collaboration as the collaboration demonstrates high potential to be a complex adaptive system: i) continuous and frequent communication and information flow, ii) non-linear relationships, iii) counter-acting forces and agendas, iv) development of complex language. Contribution The results of the case study will demonstrate self-organization of a mid-size scientific collaboration by revealing how researchers from disciplines come together, their communication and information behaviors, and motivations. Scientific research has been performed collaboratively for some time and the literature about uni- and multi-disciplinary studies provide valuable insights; however, there is still room for research on transdisciplinary collaborations (in which researchers from different disciplines work jointly to create a shared conceptual framework that integrates and moves beyond discipline-specific theories, concepts, and approaches, to address a common problem). This paper will address such need. Needless to say that the results will benefit the science and technology studies community as collaborative and transdisciplinary research has becoming more common and important in the last decade. Moreover, DataONE also answers the NSF call to action for cyberinfrastructures to support science (NSF, 2006) which means funding opportunities are and will be available for such projects; thus, revealing the dynamics will be useful who are interested in grants as well. Bibliography DataONE (2009). About retrieved on November 18, 2009 from https://datanet.ecoinformatics.org/about NSF Cyberinfrastructure Council (2005). NSF's Cyberinfrastructure Vision for 21st Century Discovery (Version 5). Yin, R.K. (1984). Case study research: Design and methods (4th ed.). California: Sage Publications.

194. Humans, Non-Humans, and Those in Between

10:45 to 12:15 pm

12: 1232

Participants:

Embodiment in computer-mediated environments. *Jennie Olofsson, Luleå University of Technology*

Summary Probing computer-mediated environments, this study investigates the roles of gender and embodiment in conjunction to situated acts of translation between movements. As bodies occupy computer-mediated environments, they traverse a range of spaces, which brings forth situated acts of negotiation proceeding executions. Adopting an ethnometodological approach, the study thus intends to capture the repleteness of situated activities. Abstract The computational embeddedness in contemporary society has been subjected to extensive academic research. Computer games, online communities, MUD´s and MOO´s provide the empirical backdrop for extensive research (see for comparison Bell 2001; Fornäs et al. 2002; Smelik &

Lykke [eds.] 2008). Scrutiny of computer-mediated environments equally propels a renewed problematization of gender and embodiment. As human bodies straddle different tiers of reality they simultaneously map certain movements onto digital templates, mechanical devices or robots. In turn, this affects continued executions. Katherine Hayles (1999) for instance outlines the inextricability between embodiment and information; in doing so she effectively merges traditional notions of embodiment with new tenets. Probing computer-mediated environments, this study seeks to contribute to the field of STS in that it envisages, not only the inextricability between human and machine, but equally between spaces. In doing so it adopts a well-known term within technical design, henceforth referred to as 'mapping practices'. Mapping is expressed as the relationship between two things and the subsequent results in the world (Norman 1988:23). For example, in order to manoeuvre a digital character to the right the user has to push a certain key on the control that translates into that particular direction. Through scrutiny of the different methods and means used in creation of these computer-mediated environments such as game consoles and controls, animation programs and motion capture techniques the intention is to track situated acts of mapping. Ethnographic methods have suceessfully been used in laboratory studies (see for comparison Alac 2008; 2009); they provide an understanding of how the social situatedness is an effect of embodiment (Alac 2009:492). Observing science in action (Latour 1987) allows for an in-depth understanding of movements, gestures and verbal expressions that would otherwise be difficult to decipher. Values that pervade physical settings are materialized and reproduced in computer-mediated environments at the same time as humans actively articulate and reshape the context that encompasses their actions (Goodwin & Duranti 1992:5). Saying this, the body forms a crucial part in spatial orientation, which at once orders, as well as is ordered by social norms and expectations. Acknowledging its gendered particularity suggests acts of translation to be utterly ambiguous in that men and women are given access to, or secluded out of certain sites, much due to their assigned gender. Critical scrutiny of mapping practices subsequently serves to bring forth the gendered implications of computer-mediated inhabitation. As bodies occupy computer-mediated environments, they simultaneously traverse a range of spaces, which calls for a revivified understanding of spatiality, not as simply restricted by physical laws, but as fickle yet intermingling tiers of realities that exceed corporeal boundaries.

Anime Robots and Robotics in Science, Technology and Society. *Jawn Tze-hin Lim, Harvard University*

This paper analyzes the global prevalence of Japanese anime robots and its codependency with robotics in terms of its scientific instrumentality, technological parameters and sociological values. Visions drive technology and technology drives history. Historically, science-fiction and science required the judicious mixture of mechanical plausibility and hypothetical projections. Specifically, conceptual robot designs and robotics simultaneously push the boundaries of utopian ambitions and engineering precision. Science-fiction assisted by the Japanese Anime robot genre has influenced societies through global media in the past 50 years. It continues to gain wide-spread popularity through the agencies of large-scale conferences such as Comic-Con and ubiquitous following through the Internet and movies. Formal robotics has yet to keep pace with the ideological speculations of Anime. How can we better understand the emergence of robot anime, its feedback into science-fiction and the corresponding properties in the future of robotic technologies? From Post-War "Mecha" Anime robots to the international recognition of Hasbro's Transformers which has Japanese origins, robots evolved to reflect changing expectations of these machines. The Japanese genre from Astro-Boy (1963), Starvenger (1974), Gundam (1979), Macross/Valkyrie (1980), and Evangelion (1995), is far removed from the Czech science-fiction play entitled "Rossum's Universal Robots" by Karel Capek (1921), where the term "Robot" was first introduced. The initial cyborgs at the human scale are dwarfed by Anime Robots which are of a more vehicular scale. Since its inception, Robots carry with it looming questions of anthropological progress versus artificial intelligence, militaristic ambitions versus domestic purposes, cognitive science versus theological content, natural history versus industrial design, etc. These important comparisons highlight how Anime robots are unshackled by the immediate mechanistic and electronic limitations unlike for instance the Mars Rover and other robotics by Cynthia Breazeal at MIT. Conversely, Roboethics highlights the dehumanization of humans and the anthropomorphization of machines. Several seminal texts that are tangential to this field would provide the methods of this study and resolve the intellectual implications in science, technology and society. Robert Heilbroner's analysis of the progressive accumulation of technologies building upon one another would be useful in reading the field of robotics technology. Leo Marx's definition of technology as "the study of useful arts" sets the background for the discussion of Anime Robots as machine, machinery and mechanism. Upon which the slippery and ironic term "science-fiction" in its 1926 Gernsbackian incarnation, was as James Gunn observed, more appropriately called "speculative fiction" by Robert Heinlein. Bijker and Pinch's construct by which the sociology of science and the sociology of technology are contrasted against each other would be is useful in identifying the extent of which Anime robots and robotics affect or are affected by society, and in turn science and technology. Lastly, Fredric Jameson's query into how we might speculate and anticipate the future can be applied this as well. The intersection of Anime robots and robotics is important to the history of science, technology and society for lack of a clear epistemology. This study introduces a framework to read the conceptual with the computational in this field.

"They Increase in Beauty and Elegance": Cadavers As Models in American Medical Education, 1800-1850. *Rachel N. Ponce, University of Chicago*

Over the past 25 years, STS scholars like Nancy Cartwright, Ronald N. Giere, Soraya de Chadarevian and Nick Hopwood have begun questioning how scientific models can both enable and constrain knowledge production and transmission. Models are essential to our understanding of complex systems, but as simplifications of these systems, they are of limited usefulness and can even be misleading. They are the artifacts of a process of transition that occurs when objects of critical study become been stripped of some of their complexity and transformed into pedagogical tools. But when models are used as pedagogical tools, important epistemological difficulties are raised: when does a model fail to convey the very information which students seek from it? Sometimes, it is readily apparent when a model is ill-suited to our ontological needs, but sometimes the very complexity of the procedures which we use to interrogate that model obscure the model's inadequacies. In order to explore the epistemological relationship between model and the methods with which it is interrogated, I borrow the concept of "procedural rhetoric" from media studies scholar Ian Bogost to describe the phenomenon whereby processes themselves advance rhetorical positions and apply it to an historical case study. My paper investigates the birth of one very unique scientific model—the cadaver—as a pedagogical tool in nineteenth century American medical education. Although the early nineteenth century offered a unique moment in which differences in bodies could have been studied comparatively and methodologies of dissection could have been mobilized to produce new medical knowledge, instead, American medical students were given the cadaver as a representation of an ideal form of the living human body. In effect, the cadaver was transformed from a potential subject of medical inquiry into a model for medical education. In the process, I argue that physicians ultimately failed to grapple with the gaps between reality and representation embodied by the corpse and ignored the deliberate conceptual and physical transformations require to make the cadaver a viable pedagogical model. In doing so, I believe that nineteenth century physicians unwittingly silenced the corpse and denied students the

knowledge that they sought from it. In this paper, I look carefully at dissection manuals, anatomy textbooks, published lectures, and textbooks on pathology to expose how the verbal rhetoric used by early nineteenth-century physicians to justify including dissection of the cadaver as part of medical education was effectively undermined by the procedural rhetoric, or the rhetoric of the process of dissection itself, embodied in the pedagogy of the dissection process itself. Although this paper is fundamentally a project in the history of science and historical epistemology, I believe this paper tells a relevant cautionary tale both about pedagogy and scientific models. Though models have often been treated as if the knowledge they convey were somehow self-evident, this historical case study of what was once considered the most valuable tools in medical education, the cadaver, shows that failure to understand the procedural rhetoric of pedagogical techniques can realistic even the most complex scientific models.

Conceptions of human and non-human agency in design: A recent cultural history. *Daniel Cardoso, Massachusetts Institute of Technology*

Cultural theorists and critics have examined -and to some extent dismantled- the notion of author as an individual subject and its auxiliary notion of "work" as an expression of the self. More recently, science and technology studies (STS) and feminist scholarship have provided conceptual tools for approaching questions of agency from an enriched socio-material perspective as an interaction between a diverse network of human and nonhuman actors. This paper reviews conceptions of agency coming from the above-mentioned fields and proposes a reconceptualization of the question of agency in contemporary design, as a shift from a paradigm of representation through correspondence to a paradigm of material, human, and non-human, performances. In order to unpack key questions of human and non-human agency the paper's introduction considers two seemingly disconnected episodes. First, a 1959 photograph of Marcel Duchamp operating one of Jean Tinguely's art-making sculptures "Meta-Mátics", and second, the politics of authorship at LA-based architecture consultancy Gehry Technologies. The paper then reviews conceptions of agency from critical theory and contrasts them with more recent works from science technology and society (STS) scholarship, outlining the cultural trajectories of the concepts of work, author, and expression. The paper observes how, by dismantling the concept of the author, critical theorists provide a ground for what could be described as a healthy materialism of design practice -a rejection of subjective and idealized creative practices- while perspectives in science and technology studies (STS) suggest that the move towards the author's disappearance -if tempting- may not help understand the complex network of agencies that underlie design-production endeavors, a crucial aspect of discourses of professional identity and responsibility in contemporary design practices. The paper observes how contemporary discourses on design are largely articulated in representational idioms that render aspects of design production such as technical expertise, materials, and tools, as passive recipients of designs -in both its formal and political senses- and supports the view that if we are to approach critically questions of authorship and professional identity in design we may need to consider the constitution and adoption of new performative idioms for accounting for the network of material, human and non-human agencies involved in contemporary design production.

Playing with Simulated Animals: Nintendogs as Companion Species? *Bart Simon, Concordia University*

At the level of popular imagination it would seem that research programs in artificial intelligence, computer graphics, and robotics have demonstrated that believably simulating human beings is a difficult if not impossible task. This has spawned philosophically informed side programs aimed at the simulation and reproduction of lower orders of intelligence or if not "lower orders" than at least less fraught ones. No matter how advanced the neural network learning and fuzzy logic processing of artificial brains becomes a culturally situated "uncanny valley" separates humans from their machine pretenders. Machines pretending to be animals however, are an altogether different story. This paper explores the case of machines pretending to be dogs not as a matter of 'true' AI or robotics but rather as popular interactive simulation. The machine platform in question is the ubiquitous Nintendo DS handheld digital game system and the animal simulation is Nintendogs, the best-selling pet simulator developed by Nintendo as a launch title for the DS in 2005. The platform and software together constitute a puppy-machine in interaction with a human player as owner and trainer. It is no accident that the assemblage composed of Nintendogs software, the portable DS hardware and player (as owner/trainer) bares a family resemblance to Donna Haraway's relationship with the dog Cayenne Pepper in her accounts of agility training in When Species Meet (2008). My analysis is constructed this way in order to consider Nintendog agility training as an intriguing if not scandalous case of what Haraway describes in terms of a "becoming with." In this case the companion species in question is not the dog-human relation Haraway is concerned with, but rather the strange machine-human relation that obtains when the machine pretends to be a dog and the human pretends to be a dog owner and trainer. I am not ready to argue that the stakes of this are particularly cosmopolitical but it does raise questions about the possibility of forms of popular digital play to mess with the otherwise hyper-rationalized conditions of its production.

"Big questions from a little study of infrastructure: Putting Non-humans to rights." *Trevor Pinch, Cornell University*

Using the author's own experiences as an actor in local politics, the paper examines several cases where pieces of mundane infrastructure are contested. The cases include eruvs, traffic-calming technologies, and invisible dog fences. The argument is that in contra distinction to abstract philosophical approaches to technology, the social construction of technology (SCOT) needs to return to the examination of the mundane embeddedness of technologies in everyday life. It is argued that an adequate approach to the role of the human and the non- human should not buy into a distinction between ontology and epistemology but instead should focus upon the contested interaction of humans and non-humans in everyday life and thereby restore the analysis of intentionality and meaning to its rightful place at the core of the sociology of technology.

195. Science and the Law

10:45 to 12:15 pm
13: 1312

Participants:

The Disputed Territory of Forensics: Competing Claims to the Epistemic Identity of the Law-Science Interface. *Christopher James Lawless, London School of Economics and Political Science*

This paper aims to contribute toward discussions concerning the impact of neoliberal policies on technoscientific developments within policing and criminal justice, by focusing on how these policies have served to open up new interpretive spaces within the intersection between science and law. I focus in particular on the attendant rise in risk management strategies which have served to function as key components of neoliberal policies. With recourse to a specific example, namely the introduction of a technology of epistemic risk management in UK forensic science, I show how the imposition of such sensibilities has served to destabilize a previously well-entrenched set of institutionalized practices, which marked the co-construction of a particular relationship between science and law enforcement actors. I contrast this particular technology, the Case Assessment and Interpretation (CAI) model, with alternative conceptions of the science-law interface which mark differing interpretations of the neoliberal ethos, linked with notably differing risk perceptions and priorities. Through this comparison I argue that differing paradigms of forensic science can be characterised, which reflect ongoing contestations for epistemic authority between scientific

and State actors. I explore precisely how and why the imposition of this particular mode of governance creates such divergent consequences for the shaping of science in public service. By outlining these issues I also consider how this example relates to certain arguments made in the STS literature concerning the 'co-production' of social and scientific orderings (Jasanoff 2004). Whilst many previous studies of the social construction of forensic science have emphasized contingent and localized aspects, this paper represents an attempt to address the wider structural and political dynamics underpinning the construction of science in the service of law enforcement. It concludes by considering how the given example highlights the complex interdependencies which exist with regard to science and technology, and wider public policy concerns. Hence this paper broadly aligns itself with work associated with 'The New Political Sociology of Science' (Frickel and Moore 2006).

Lawyers as Scientific Gatekeepers: Is there an ethical duty to vet courtroom experts? *David Caudill, Villanova University*

In the effort to ensure reliable science in the U.S. courtroom, judges have recently taken on the role of gatekeeper to evaluate expertise. However, continuing dissatisfaction with the quality of courtroom expertise has led to a suggestion that lawyers should also be gatekeepers because they either have, or should have, an ethical duty to ensure the reliability of their testifying experts. I argue that this proposal is not only based on a misunderstanding of the lawyer's role as advocate, but also that the proposal is based on an idealized view of science as relatively clear and certain in the legal context. My argument is related closely to the STS literature concerning disclosure of the social, rhetorical, and institutional aspects of the scientific enterprise, especially insofar as those aspects are not recognized or acknowledged in most legal contexts. One result of an idealized view of science in law is that dissenting science is ignored, that is, in most scientific controversies it is assumed that one side is truthful and the other side is lying. I will argue that such an image of scientific controversy is oversimplified and misleading.

Scientific controversies and pollution trials in Japan, 1967-1973. *Tomohisa Sumida, University of Tokyo*; *Yoshiyuki Hirono, The University of Tokyo*

Environmental pollutions of several Japanese areas became evident in the 1960s. Although the executive and legislative authorities tried to manage them with establishing some offices and enacting a number of laws, victims of the major pollutions took their cases to court for the compensation. At the courts, the evaluation of scientific evidences was one of the major contestations, and scientists were invited to give testimonies for both the plaintiff and the defendant. The plaintiff's lawyers and scientists sometimes tried to avoid the scientific controversies. This paper investigates how the lawyers and scientists of both sides engaged the scientific controversies at the pollution trials. In the brief span of less than two years, between June 1971 and March 1973, the four major pollution trial cases all ended in the victory of plaintiffs. They are 1) Niigata Minamata disease (mercury poisoning, 1967-1971), 2) Yokkaichi asthma (respiratory ailment, 1967-1972), 3) Itai-itai disease (cadmium poisoning, 1968-1971), and 4) Minamata disease (mercury poisoning, 1969-1973) (in order of the lawsuit date, only the first trials shown). In the adjudications, a number of remarkable legal principles appeared: the shift of the burden of proof to the defendant, the acceptance of epidemiological proof, and the designation of communal action illegality. The pollution trials in Japan around 1970 will show not only how scientific controversies were unfurled on the trials but also how the judiciary proceedings developed through scientific controversies. Reference: Ui Jun ed. 1992. Industrial pollution in Japan. United Nations University Press. (http://www.unu.edu/unupress/unupbooks/uu35ie/uu35ie00.htm)

Science, Law and Order: the interpretations of a regulatory regime on animal experimentation by biomedical researchers. *Ana Tereza Pinto Filipecki, FIOCRUZ*; *Carlos José Saldanha Machado, FIOCRUZ*; *Márcia de Oliveira Teixeira, FIOCRUZ*

Law is a cultural form, a regime for ordering social life, constructing cultural meaning and shaping group and individual identities. Culture carries the regulative force of legal practices and norms. Biomedical research is a global-local regulated enterprise. Based on these three premises, we investigate biomedical researcher interpretations of the new Brazilian law on the scientific use of animals. Law 11794 was sanctioned in 2008 and the Decree that regulates it, in 2009 (Decree 6899). The new legislation establishes that the Ministry of Science and Technology is nationally responsible for the development and the implementation of policies concerning laboratory animals. The National Animal Experimentation Control Board, a normative, deliberative, consultative and appealing council under the presidency of the S&T Minister, will set standards for the use, care and breeding of scientific animals. The Board is responsible for the accreditation of the institutions and the licensing of the regulated procedures. The institutions, the research projects and the regulated procedures will be registered in the Board. The Institutional Ethical Committee on the Use of Animals will provide the information to the Board registry. Only research projects approved by the Ethical Committee can conduct experiments with animals. Animal experimentation is now restricted to institutions accredited by the Board, and can be performed only in the institutional level. As we move on analyzing the articles of the Law and the Decree, we realize that researcher will have to perform changes in order to comply with the novel regulatory framework. The question is: are biomedical researchers changing their scientific practices (processes, instruments, qualifications) in search for compliance? Do researchers associate these changes with the new legislation? To answer these questions, we are conducting a case study in a centenarian biomedical research organization, a public institution of the Ministry of Health, located in the city of Rio de Janeiro (Fiocruz/RJ). We interview 20 biomedical researchers, leaders in their fields and/or head of laboratories. The interviews were preceded by content analysis of legal and institutional documents and will be followed by laboratory observations. Our contribution to the STS literature consists of trying to demonstrate the hypothesis that the values of a given science are intrinsically linked to the society values that is embedded. Therefore, our investigation aims to contribute to the improvement of Fiocruz/RJ research projects governance because in the public sector the governance reports to norms, processes and conducts through which interests are articulated, resources are managed and power is employed in society, in other words, it means the State capacity to serve society.

It all happened so slowly - On controlling function creep in forensic DNA databases. *johanne yttri dahl, NTNU and Norwegian Police University College*; *Ann Rudinow Saetnan, NTNU*

Forensic DNA databases are implemented worldwide and used increasingly. Part of this increasing usage is arguably a matter of function creep. Function creep refers to changes in, and especially additions to, the use of a technology. In this paper we explore the notion of function creep as we discuss why and how it has taken place on forensic DNA databases. We also consider what future function creep it is possible to envisage. As even security enhancing technologies may contribute to insecurities, what safeguards should be in place to render function creep governable? We use the Norwegian DNA database, expanded considerably as recently as September 2008, as our primary case for discussion. Additionally we use examples from other forms of databases where similar function creeps have taken place. The paper isn't data-driven but draws on a wide spectrum of data: governmental documents, public and Parliamentary debates, and interviews. The function creep concept can be seen as a "cousin" of the concepts of "interpretative flexibility" and "moral economy" of technology. While the function creep concept has been mentioned in STS literature as well as social studies of

surveillance, it has not been explored in depth in either field.

196. Knowledge Production at the Public-Private Interface

10:45 to 12:15 pm

13: 1321

Participants:

Incentives and Obstacles to University Patenting: A Comparison between Patenting Scientists and Non-patenting Scientists. *Wan-Ling Huang, University of Illinois at Chicago*; *Eric W. Welch, University of Illinois at Chicago*

During the last two decades, U.S. universities have deviated their role from the earlier linear mode that views universities as a producer of pure basic science (Bush, 1945) to the triple helix perspectives which emphasize the function of universities on fostering technology development and economic performance (Etzkowitz, 2008). This trend drives researchers' attentions to investigate causes and consequences of the change of university mission. Although the system of innovation approach and the triple helix perspectives shed lights on recursive nature of innovation process and emphasize the interactions among multiple actors, they have a limited potential for understanding the roles of inventors per se (Göktepe, 2008). In this paper, we introduce a theoretical framework of patenting behavior at micro-level based on two bodies of decision-making literatures: rational choice theory and institutionalism. Specifically, we address the question: Is the patenting decision made by university scientists better explained by self-interest motivations, institutional factors (i.e., rule of games) or both? In contrast with rational choice theory that argues individual behavior is shaped based on a series of calculations to maximize self interests, normative institutionalism emphasizes individual behavior can be influenced by institutions through formal rules, policy, or norms. This study proposes to test the two theories regarding their ability to explain inventors' patenting decisions. Based an in-depth literature review, the following hypotheses result: H1: Patenting scientists perceive higher tangible and intangible benefits of patenting than non-patenting scientists. H2: Patenting scientists perceive higher compatibility between open science and proprietary protection than non-patenting scientists. H3: Patenting scientists perceive higher support of patenting activities from their home institutions than non-patenting scientists. The data for this study comes from a 2010 national survey of 1,370 U.S.-based university patenters and non-patenters, of which 934 are patenters, under the auspices of the NSF-funded project titled "Patenting Behavior of Academic Scientists and Engineers: A Micro-level Analysis of the Factors that Determine the Production of University Patents." The survey collected data on scientists' patenting performance, research activities, perspectives and attitudes regarding patenting, perceptions of institutional and organizational attributes, and demographic characteristics. This unique data allows us to compare differences between patenting scientists and non-patenting scientists in terms of important factors that determine patenting behavior. Chi-square statistics test is employed to examine the mean differences regarding identified key factors between the two groups. The finding of this study will contribute the literature in three ways: First, it sets up a theoretical framework for the analysis of patenting behavior at university and offers a primary investigation for future empirical study. Second, similar research has been conducted for European universities. Our U.S.-based analysis of patenting behavior can be compared with the previous studies. Third, this study will inform policy makers how to design an appropriate incentive system to foster university patenting activities and also provide university knowledge to improve management purposes.

Study on the Ownership of Intellectual Property Sponsored by Government of Science and Technology in China. *Han Zhang, Tsinghua University*

In July, 2008, the State Council of China published the National Intellectual Property Strategy, which was the first time for the Chinese government to promote the Intellectual Property as its national strategy, and admitted that the Intellectual Property as a strategic resources for increasing the competitive ability of China. Among the crucial problems in the creation, exertion, protection and management of the Intellectual Property are the ownership of it. In this survey, I focusing on the ownership of Intellectual Property sponsored by the government of the significant project of science and technology collaborating with the university and research institutions in China. The Bayh-Dole Act of the U.S. in 1980 plays deeply influence on China, especially on the science and education system. The law of progress of science and technology, recognized as the basic law of science and technology in China, emulating the core spirit of the Bayh-Dole Act. The Bayh-Dole Act of 1980 in the U.S. was initiated with improving university-industry collaboration and technology transfer in the U.S national innovation system. The passage of the Act and its following amendments have established the ownership of the Intellectual property sponsored by the federal government, underlying the property transfer was an idea change that allowing the common resources to be owned by the private individual for the highly efficient commercial development of the products. Many of the members in OECD intend to emulate the Bayh-Dole Act, as well as in some developing countries. However, what the legislator overlooked is the unique structural institution that making sure of the successful exertion of the Act, even if it is works as the initiation of this Act. The long collaboration of the university and the industrial, and the resources of the funding for the university research in the U.S. are various with the other countries. From the STS perspective, I first concern with the idea underlying the transfer of the property in the Intellectual Property, based on the literature study, mainly from the source of Web of Science, and the core journal literature analyzing of China, Compared of those studies, I find the study of this issue is nothing more than one-fold. Most of the writers side with the great influence of the Bayh-Dole Act, and propose to transfer it to China. However, in the U.S. academia, the studies are multi-perspective, including institutional economics and property economics, the history of law, and the STS perspective, such as the theory of Actor network. Serving as the lacking critical thinking analyzing of this issue I intend to survey the ownership of the IP from the STS perspective, and this is crucial for the policy makers and legislators. Put more consideration of the institution exertion environment, economic and legislation as well as the management of IP. The following questions should first be answered: 1. Does the Bayh-Dole model legislation actually stimulate the enthusiasm of relevant actors? 2. How does Intellectual Property influence the basic research atmosphere?

The role of 'global' PPPs in vaccine research for neglected diseases: The case of tuberculosis. *Peta Freestone, The University of Melbourne*

Scientists discovered the cause of tuberculosis (TB) in the 19th Century. A diagnostic test was developed eight years later. Drugs to cure TB were available to clinics by the 1950s. Yet in 2008, the World Health Organisation estimated that one third of the world's population was infected with latent TB and that each year an additional 30 million people are infected, 8 million develop the active disease and 2 million die. Furthermore, current prevention, diagnostic and treatment tools are now becoming outdated and inadequate to identify, contain and eradicate TB, and we now face the global health threat of drug-resistant strains. Since the last major innovations in TB management, STS scholars have identified fundamental changes to the conduct and contexts of science. In particular, the phenomenon that Callon termed the 'hybridization' of science and the market has profoundly impacted on research for neglected diseases. Not only have developments in intellectual property law enabled the privatization of innovations previously considered to be in the public domain (such as mathematic formulae and living organisms), global trends towards commercializing innovation also impact on the motivations, outputs and identities of public and academic scientists. Given the increasing economic imperative on scientific research, it is not surprising that in recent decades science for TB - a disease of poverty - has been limited. In relation to other biomedical

innovations, solving the TB problem will not be a highly profitable venture, so market forces alone will not solve this problem. To overcome these obstacles, as is similar with other neglected diseases, new forms of governance for TB research have developed, including the creation of large public private partnerships (PPPs). These organizations aim to draw together public science knowledge with private science's experience in product development management. Using the TB vaccine science world as a case study, this paper investigates the role of PPPs in the pursuit of innovative vaccines for neglected diseases. It builds on related work such as Smith and Chataway's (2005) study of the International AIDS Vaccine Initiative (IAVI). The role of PPPs specifically in the pursuit of a new TB vaccine has not been previously investigated using the methods presented in this paper. This research therefore offers a timely case study for STS scholars considering the role of PPPs in the development of vaccines more generally. In the early part of this study, bibliometric data and social network analysis tools were used to identify key players in the TB vaccine research world. This was followed up in 2009 and early 2010 with over 100 interviews with scientists, project managers and policy makers from four different countries. The findings resonate with claims from the science policy literature that despite their admirable missions, PPPs in TB vaccine research are limited by national contexts, financial constraints and relatively temporary mandates. This paper therefore argues that whilst PPPs are increasingly championed as key facilitators of innovation for neglected diseases, they cannot fully transcend the ongoing tensions between public and private science.

Prevailing Academic Entrepreneurship Changes the Norms and Transaction Forms of Academic Cooperation: Material Transfer in Life Science and Material Science in Japanese Universities. *Sotaro Shibayama, Georgia Institute of Technology*; *John P Walsh, Georgia Institute of Technology, School of Public Policy*; *YASUNORI BABA, Research Center for Advanced Science and Technology, the University of Tokyo*

Using a sample of academic scientists, this study examines how academic entrepreneurship has affected the scientific norms and forms of academic cooperation. This study specifically focuses on material transfer transactions as a unique form of academic cooperation, and examines the conditions where research materials are transferred between scientists. We collected a survey sample of 672 scientists in Japanese universities in 16 fields of life science and material science. The data was analyzed using logit regression models and hierarchical linear regression models. The results indicate that the norms of scientists are affected by a field-level intensity of academic entrepreneurship. In scientific fields with a high level of entrepreneurship, the behaviors of scientists tend to shift toward a personal benefit-oriented direction. That is, scientists prefer to secure their own benefits through direct exchange, in which supplier-side scientists provide their resources on the condition that they receive certain forms of reciprocation (e.g., coauthorship) from consumer-side scientists (as opposed to a more generalized exchange in less entrepreneurial contexts). In addition, the results suggest that prevailing entrepreneurship increases the proportion of material transfers based on the direct exchange mechanism, and more importantly, decreases the total frequency of material transfer. Furthermore, this is true even for scientists who are not involved in entrepreneurial activities (e.g., commercial activities). These results imply that academic entrepreneurship has affected the traditional scientific norms that underpin the cooperative relationship in academia, and consequently, has deterred the flow of academic resources among scientists. Because impeding entrepreneurship is contradictory to the current policy intention, science community should implement certain mechanisms either to incentivize academic cooperation formally (e.g., standardized rule of acknowledgments), or to suppress direct exchange transactions (e.g., central repositories for research materials).

Designing Open Spaces for Different Knowledges in a Graduate Program. *peter stegmaier, Department of Science, Technology, and Policy Studies*

Many actors and interests are involved in the design and governance of graduate education, also in STIS. The workshop will address both issues of content and of design. For instance, the institutional and or-ganizational interfaces of educational programs in this field must fit local and global needs. Boundaries between public and private, universitary and other degree-granting bodies’, fundamental and applied research are blurring. Worldwide migration of knowledge, students, jobs, research, and education pro-grams demands considerable flexibility from all participants. Yet, science and knowledge regimes are far from uniform; science policy and broader political-cultural contexts of science governance differ enor-mously. “Interdisciplinarity”, “internationalization” are examples for buzz-words in rather abstract de-bates on education development. Yet, the main question is, how far do they apply to the governance of STIS? Traditionally this “discipline” has been neither a national nor mono-disciplinary enterprise. In this presentation I will elaborate on the process of profiling a graduate school program (MSc + PhD), called “Governance of Knowledge and Innovation”, in a heterogeneous academic and managerial context in such a way that, on the one hand, different knowledge have their place and, on the other hand, all per-spectives get a sound basis for further study and research.

197. Systems of Innovation

10:45 to 12:15 pm
13: 1322

Participants:

Research on the Model of Knowledge Facilitating Based on Industry Clusters. *he jijiang, Center of STS*

The study is about the issues related to the role, traits and the model of knowledge facilitating based on industry clusters. Different from previous research, this paper wants to emphasize the importance of knowledge facilitating in the study of industrial competitiveness and made the empirical research about the Shenzhen city which is a new city with only thirty years history, but nowadays, is the fourth economical city in China. The article consists of four parts. A brief introduction is given in the first part of this study. Part two concerns itself with the entraining, transforming and innovation of knowledge in industry clusters. The survey and analysis about the knowledge facilitating in Shenzhen city industry clusters and a knowledge facilitating model form the focus of part three. Part four ends the whole paper with the conclusion that knowledge facilitating can effectively raise the industrial competitiveness and Shenzhen city must change its policy supply to encourage the knowledge facilitating activity. We find in our research that the knowledge facilitating play a greater role in the development of industry clusters. Based on these findings, we may conclude that first: knowledge facilitating is different from the science and technology intermediate service; second, the core character of knowledge facilitating is organizing the mode 2 production of knowledge that be defined by Gibbens; third, Shenzhen city must redesign the policy supply for the industry cluster. Some useful implications obtained from this study include national innovation system and regional innovation systems which wish to increase the industry competitiveness must pay more attention to the knowledge facilitating. Key words: knowledge facilitating; industry cluster; knowledge production

How Indigenous Innovation Become Indigenous: Two Performativity and their Construction in China's Policy Learning. *Chengwei WANG, Center for Science, Technology and Society, Tsinghua University*

Indigenous innovation could be one of the most important S&T policy innovations in 21st Century China. And the special expression "Zizhu(自主)" did have great difficulty make itself clear to the world when translated into

English. To some extent however, the original idea of indigenous innovation derives from the trends of thought "National Innovation System" (NIS), which is already the core of the S&T policy beforewards. This paper will explain why and how this jargon comes from by examining the construction process of indigenous innovation policy during the policy learning. Two kinds of performativity (means discourse not only describes but also creates the phenomena it describes) was distinguished as an analytical framework: (1) The Butlerian performativity, which implies the a discourse can only produce the effects that it names if the certain action and exercise is performed by a binding power; (2) The Callonian performativity, which implies a corresponding (social-technical) agencement being constructed, or we can say successful (re)assembling of the actor network plays a central role in this transition. It is found in the historical analysis that, the economists tried to perform the policy learning basing on the citation of frontier's power assuming the domestication of the universal "best practice" such as technology acquisition could help to catch-up like they always did. The scientific and intellectual world on the contrary, decided to use a combine strategy that they build up their new agencement by providing new policy benchmarking, case studies, as well as the most crucial part translated the relationship between catching-up and frontier countries from "blind faith" to "confidence rebuild", since they were in a weak position as policy advisors. The reiterative and citational practice was used too by binding the interest of the scientific and intellectual world to the authority of central government in the (anti-)globalization context. In sum, the indigenous slogan rooted deeply in the construction of a new actor network which does cause lots of policy changing after written into the state plans for medium and long-term development of science and technology. While the Butlerian sense of performativity also brings some risk for the policy implication. The citation to the central authority could cause some retreat to the shadow of planning economy, where this new slogan could be used as a big umbrella to cover the advantage gaining through power like rent-seeking. And the two kinds of performativity not only produce the knowledge content of policy learning, but also construct the procedure and identity. Finally we can still conclude that, these two kinds just show the duality of performativity, where the Butlerian sense denotes the continuity and the Callonian one denotes the generativity.

Nanotechnology in developing countries: An innovation system approach to building capabilities. *Manish Anand, The Energy and Resources Institute*

Building innovation capability is critical for economic growth not only in the developed countries but also developing economies. Countries that do not succeed in developing and sustaining appropriate innovation capabilities and well-functioning systems of governance should be expected to continue to lag behind. Empirical studies of industrialization process in Asia and Latin America has shown that capability building is a pre-condition for successful catch-up. However, developing countries find it hard to develop the capabilities and a continual emergence of new S&T developments poses additional challenge for joining this virtuous dynamics. In this regard a grounded understanding of capabilities for development purposes assumes greater importance in the context of developing countries that are engaged in 'catching up' or 'leapfrogging'. Nanotechnology, an emerging technology dealing with the development and application of materials, devices and systems with fundamentally new properties and functions because of their structures in the range of about 1 to 100 nanometres, offers opportunities to developing countries to address developmental needs. However, to successfully engage with nanotechnology, developing countries would need to address a range of issues pertaining to research, technology development, skills requirement, institutions involved, risk issues, regulatory and governance structure and stakeholder engagement. This may pose significant challenge to countries trying to engage with nanotechnology which thus needs to be factored into the capability building process. In this paper, I intend to investigate the process of capability building and understand the capability requirements in the context of nanotechnology in developing countries. To study the countries' abilities to harness benefit from emerging technologies and to gain a broader view and develop a systemic approach taking into account the observation that technological and social factors interact in the process of economic development, I intend to use the analytical tool of 'innovation system' approach. Innovation system characterized by the level and range of university research, the presence of science-industry bridging mechanisms, vertical and horizontal links among local firms, user-producer interaction, and the types and levels of firms' innovative efforts (Nelson, 1993) enables a country to generate and exploit the opportunities posed by scientific and technological developments. The adoption of innovation system approach to developing economies is a relatively recent phenomenon and there is a need to adapt and further develop the concept so that it becomes more adequate for the situation in developing countries and reflect upon the challenges, opportunities and strategies in the context of new S&T developments. This paper would add to the literature on capabilities an explanation of: adaptation of the concept of innovation system in the settings of developing countries in such a way so as to stimulate policy learning and develop capabilities and strategies to engage with emerging technologies. For this I would argue that in the developing countries the focus of innovation capabilities, which at present is heavily inclined towards R&D, needs to become more comprehensive recognizing innovation dispersed across a range of production activities and covering all aspects of competence building in socio-economic activities.

From Invention to Innovation:A Case Study on the Innovation of Laser Phototypesetting System for Chinese Character. *ZHOU Cheng, Peking University*; *LI Xing, Center for Social Studies of Science, Peking University*

Abstract: In China, of all the large-scale scientific research projects, one like the core subproject of 'Project 748' —the Sophisticated Phototypesetting System for Chinese Character which totally came through all the stages of basic research, prototyping testing, pilot-plant test, small-batch production and large-scale promotion, finally realized the industrialization under the demand of markets, is actually rare. This paper systematically studies the industrialization process of the Laser Phototypesetting System for Chinese Character, and considers that the reasons why the Chinese Laser Phototypesetting System was able to span the "Valley of Death" mainly include: (1)The persistent promotion of the government laid the foundation of this successful innovation;(2)The essential factor which made this system seize market opportunities was the Industry-Academia-Research Cooperation;(3) The trust and support of users set the stage for the commercialization of this system;(4)The leading of the entrepreneurial scientists was the key point of the realization of industrialization;(5) The introduction of foreign advanced components and equipments strengthened the competitive advantage of this system; (6) Local resources and markets provided strong support for the exploitation of this system; (7)The immaturity of similar foreign products provided a good opportunity for the market development of this system.

198. On STS and Psychology

10:45 to 12:15 pm

13: 1331

In this Session we propose to discuss some topics of interest to Psychology using theoretical and practical contributions of STS. The Session is composed by four papers of Brazilian Psychology researchers who share the idea that the controversies about humanness are centered on the manner by which bodies, subjectivities and cognition are constructed. In this line of reasoning, Ronald Arendt will develop a serie of arguments whose aim are the translation to psychology Bruno Latour's considerations about the non separation of construction and reality, concluding that psychological entities like emotions, cognitions or learning are local stabilizations that are fabricated, indeterminated and open to risk. In the context of Science, Technology and Society Studies Ronald Arendt affirms that Actor

Network-Theory provides methodological tools that allow the proposal of psychological concepts like emotion or cognition while distributed instances in networks not dissociated from social, historical, political or anthropological approaches. Marcia Moraes will discuss some possible connections between STS and Disability Studies. Investigating the ways in which visual disability is enacted in day-by-day practices in a Rehabilitation Service of a Special Institution, in Brazil, she asks: "What does it means to 'rehabilitate' a blind person?" She argues that STS is a powerful tool to make an inquiry on disability considering that it is a theoretical and practical approach that subverts classical conceptions of disability as something that a person is, in his or herself. In STS researches, disability is investigated as something enacted, performed day after day in some practices. So, the author affirms that from STS standpoint it is possible to consider visual disability not only as a loss, as a lack of sight, but as a way of existence with its own potentialities and inventiveness. Arthur Arruda Leal Ferreira is interested in the subjectivation effect of Psychology and will present an analysis of the ways in which a canonical methodology of psychological research, the experimental one, is engaged with some subject effects. The paper will discuss that a naïve subject is a fiction because the experimental devices are not pure: it produce subjects. So, the author will discuss the performativity of an experimental device in Psychology, following the recalcitrances and the docile adhesion to the device by the experiment participants. Maria de Fatima Aranha de Queiroz Melo investigate playfulness, rescuing traditional toys in the artisan versions found in the Brazilian State of Minas Gerais and prospective movements in LAN houses to catch playfulness activities mediated by computational technologies. In both cases the aim is to follow the emergence of unknown configurations inaugurating new forms of being in the world in the relations established with other human and non human elements which are part of existing collectives. If psychology can be included in science studies - and that is the main argument of the work developed by the four authors of this session, than a lot of new themes, as those here analyzed begin to affect and transform STS theory and research. That's our contribution to the field.

Participants:

Cognition from a non modern point of view. *Ronald Arendt, Universidade do Estado do Rio de Janeiro*

In social sciences texts psychology in general is mistreated. In the middle of an argument it is common to find expressions like "this is not to be understood in the psychological sense". We can't deny that there are good reasons in those objections, since traditional psychology classically abstracted social, historical, political or anthropological instances from its analysis and 'psychological' is usually associated to behaviors dissociated from those instances. An example of this suspicion comes from the seventh methodological rule formulated by Bruno Latour in his 'Science in Action': "Before attributing any special quality to the mind , we should examine the many modes how inscriptions are collected, combined, interconnected and developed". However, what should occur if we substituted the complicated term 'mind' by more interesting terms like 'emotion' or 'cognition' in Latour's assertion? Our thesis is that a non modern, non asymmetrical psychology will emerge when emotions and cognitions are not approached as special qualities not articulated with the many modes of inscriptions, but as processes constituted in the development of those colligations, combinations and interconnections. In the context of Science, Technology and Society Studies we think that the actor network-theory provide methodological tools that allow the proposal of psychological concepts like emotion or cognition while distributed instances in networks not dissociated from social, historical, political or anthropological approaches. This mode of thinking implies the reconstruction of terms like 'psychological' (or 'subjective', 'cognitive', 'emotional', 'perceptual'): when we conceive them in a symmetrical form, they gain a special, geographical dimension, insofar that they account for articulated networks of people and things - human and non human, in Bruno Latour terms. Cognition, in this sense, although individual, is also connected to social and material dimensions. This point of view has decisive consequences: a new technology, changes the world, changes the actor's performance, and transforms his cognition. However, the way by which this technology is enacted transforms it too. In this sense the cognition also transforms the material and the social, technology included. Psychology will not be only micro-sociology but, returning to an argument of North-American psychologist William James, a space of indetermination between the individual and the network of articulations in which he is involved (' sometimes I treat my body as a simple part of external nature. Sometimes, .., I think it as 'mine'..."). It is this ambiguity that will permit talk about personal experience or individual style without falling in the traps of the mental from which Latour wants distance. This paper will try to describe a non modern psychology departing from authors of ANT like Bruno Latour, John Law, Annemarie Mol and Nigel Thrift and explore this psychology conception exposing and discussing cases of distributed cognition that involve articulations between materiality and sociality.

Blindness in action: Notes on practices of rehabilitation with people visually disabled. *Marcia Oliveira Moraes, Universidade Federal Fluminense*

This work aims to investigate the ways in which visual disability is enacted in day-by-day practices in a Rehabilitation Service of a Special Institution, in Brazil. What does it means to "rehabilitate a blind person?" Theoretically we focus on visual disability without considering it neither as a natural or biological fact, nor as a social event. In other words, we deal with this subject far from the dualism that segregates nature and society. We aim to investigate the singular and different ways in which people live without seeing. The research is based on a praxiographic investigation of reality (Mol, 2002), that is, in this inquiry, knowledge is a matter of practice, of manipulation and not of reference. Methodologically, there are some principles that guide the investigation: to study blindness in action and not in its essential or internal qualities; to follow the ways in which blindness is enacted in some rehabilitation practices; to follow the network in which blindness is enacted in a rehabilitation service of a special institution; don't pre-define the limits and the differences between to see or not to see. On one hand, the research has a political relevance because when we consider that disability is enacted in practice, we affirm that multiple actors take part on it, humans as well as non-humans. On the other hand, the research has a practical and theoretical relevance because we affirm that knowledge is not something that represents the other, but instead, it implies a practical engagement made with others. We are interested in knowing with people who lost sight, including their narratives about blindness and their day-by-day life without seeing. Finally, this paper is a contribution on the relation between STS and Disability Studies. We consider that STS is a powerful theoretical and practical tool to investigate disabiltiy not as something that a person is, in his or herself, but something that is performed in practice. In some classical literature about visual disability, blindness is defined only as a loss, and is always studied in comparison with sight. So, in this perspective, blindness is performed as a minus, a lack, or a deficit. This conception of visual disability is related to a rehabilitation discourse which practices are directed to the normal, to conduct the blind person again in the direction of the visual normality. With STS tools we can analyse it differently, we can folllow the ways in which blindness is enacted not only as a loss, but as a way of existence with its own potentialities and inventiveness. We consider that STS is a strong discourse to remake the classical conceptions of disability as well as a discourse that enables rather than disables people who can not see.

Psychology research as a docile factory of subjectivities. *Arthur Arruda Leal Ferreira, Federal University of Rio de Janeiro*

We can study this subjectivation effect of psychology in three realms: 1) in our practical devices; 2) in the diffusion of psychological knowledge, and so forth, and even 3) in research models. In this work we will exam the last realm: the way in which the kinds of research construct us. To do so, we will use some contributions from Bruno Latour and Vinciane Despret.

Their main idea is that scientific knowledge is made not by sentence representations, but by proposition articulations between researchers and researched beings. Considering this situation, they point out that human sciences have a lesser degree of recalcitrance if compared to natural sciences. In a more specific way, the aim of our research is to investigate the docile subjective effects of this traditional research design: the naïve subject one. For that purpose, we chose the more traditional and canonical methodology of psychological research. The only singular aspect of this use is that we try to investigate what this methodology wants to prevent: the subjective effects of psychology. This research was answered by high school students in Rio de Janeiro (Brazil) and tried to analyze the power of psychological statements, the trust in psychologist, and the different force of some sentences, according to some systematic orientations (as psychoanalysis and behaviorism). The results showed a clear adhesion to the psychological statements and those said by psychologists, and also a preference for the psychoanalytic and cognitivistic. In the conclusion, we will show that this docile adhesion puts in questions the existence of the naïve subject: or the experimental devices are pure, but reveal a previous adhesion of the participants to the psychological discourses; or the experimental devices are not pure and produce subjects. This research was developed with the collaboration of the Psychology undergraduate students: Camilla Pereira, Christiane Miranda, Felipe Hauttequest, Geovana Azevedo, Julia Brandão, Juliana Magalhães, Natália Barbosa, Patrícia Gavazza, Rodrigo Madeira. I am very grateful for their collaboration.

Versions of the playfulness under the perspective of the Actor-Network Theory. *Maria de Fatima Aranha de Queiroz e Melo, Universidade Federal de São João Del Rey*

The playfulness, if studied under the perspective of the Actor-Network Theory, is an emergent phenomenon of heterogeneous and complex nets between elements of sociality and materiality (Law & Mol, 1997) which understanding surpasses the limits of only one discipline, implying the convergence of several types of knowledge. Considering the playful movement as a creative matrix in a scene of trial, we reaffirm its potential to produce effects that concur for an affective, cognitive and social flexibility, being an indicative of physical and psychic health. Frequently associated to infancy, it exceeds this relation, since there is a translation all throughout the vital cycle, assuming features differentiated in each age range. As objects that function as support for the activities to play, toys and games are deeply related with the emergent sociotechnique (Latour, 2001) of the social weave of which they are part: games, toys and tricks are dislocated through times and spaces among diverse social groups, keeping similarities and, at the same time, marking differences of the versions produced in each culture, in a movement of constant translation. In a work developed in the toy library of a university, we search to carry through: 1. retrospective movements to rescue traditional toys in the artisan versions found in the region of Minas Gerais, Brazil; 2. prospective movements in a LAN house that functions as a place of experiences to catch the playfulness mediated by the computational technologies as a phenomenon in course that can be followed in reciprocal effects produced among involved agents. In the first movement, we co-ordinate works that aim to investigate the traditional handmade playful objects (toys and games) trace in the nets that support them or in the nets that frayed, decreeing its extinction. Some toys and tricks continue powerful in their agglutination potential, as it is in the case of the kites, while others are forgotten, or reveal themselves intermittently, as it seems to be the case of hula hoop and yo-yo, respectively. In second case, we co-ordinate works that intend to catch the impact promoted by the CITs (Communication and Information Technologies) on the contemporary playfulness. The playful activity, mediated by digital technologies, assumes unknown configurations, inaugurating new forms of being in the world, in the relations established with others human and non-human elements which are part of existing collectives. In these studies, we try to develop methodologies for workshops of digital inclusion with pupils of public schools, we stimulate the production of games of computational simulation software in partnership with professors of electric engineering and we try to understand the relation between the real and virtual identities in video games, with the concern to narrate the gaps and detours of this creation process while it occurs. Being "hot" phenomena, the last ones are followed, registered and publicized to be comparative to other studies. The Actor-Net Theory, while theoretician-methodological tool, allows us to circulate in border spaces never visited before, allowing discoveries originated from these unknown mixtures.

199. Food and Risk

10:45 to 12:15 pm
5: 511

Participants:

Agri-food microbes in the press: Friends or foes? *Elisabeth Gauthier, Agriculture and Agri-Food Canada*

It has been advocated that the representation of foodborne microbes in the media has been redefined upon the introduction on the market of probiotics based on the dichotomy between "good" bacteria and "bad" bacteria. Other agri-food innovations and issues have had an impact on the way microbes are represented in the press, such as their use as technological adjuvants, the introduction of new food preservations technologies or the rise of environmental and bioterrorism threats. An analysis of the prevalence and salience of agricultural and food microbes in three Canadian print media, from 1988 to 2009, will be presented, along with an analysis of the framing and representational changes triggered by specific events (e.g. food poisoning and animal/plant disease outbreaks), emerging issues (e.g. bioterrorism, antibiotic/ antimicrobial resistance) and innovations (e.g. probiotics, biotechnologies, food preservation technologies, biopesticides). The implications of these changes for the public understanding of microbial risks, the ecological role of microbes and their benefits as technological tools are discussed.

Decomposing the structure of online protests against U.S. beef import in South Korean blogosphere. *Woo Young Chang, Catholic University of Daegu*; *Han Woo Park, YeungNam University*

During the past decade, a great deal of attention has been paid to the role and effect of web technology in social, political, and journalistic activities. Whereas most of the research has focused on the political use of the Internet in Western democratic nations, there is the lack of scholarly attention that analyzes online dynamics of Korean politics. This research examines how the issue of 'US Beef Imports to South Korea' during the May and June of 2008 was diffused on Korea's blogosphere. We begin with illustrating the socio-cultural background to the case under study, followed by a theoretical discussion of Korea's politicized cyberspace. The research questions are, "What is the nature of online network among citizens about US beef issue? How and to what extent is the structure of citizen's online participation altered during a protest against US beef imports?" This question is examined based on various kinds of data that include replies, trackbacks, hits, and hyperlinks to blog postings. Further, the content analysis of blog postings based on bloggers' political positions on the US beef imports and a web link network analysis among citizen bloggers are conducted to discover the hidden political webosphere to enhance and/or lessen citizen engagement with the issue. The results indicate that there is indeed a change in terms of online discourse and network structure over this short span of time. These results are discussed in terms of new 'produsage', 'crowd wisdom', and 'long-tail' concepts.

Mad cow crisis in global trade: Mad cow disease and South Korea-U.S. Free Trade Agreement. *Dae-Cheong HA, Seoul National University*

In the realm of international free trade, the regulation of food safety is no longer within the nation states' jurisdiction, becoming

a contestable issue among individual countries. To what extent can one country determine its own safety standards and in the case of a difference in regulations, which country's policies should be favored and on what grounds? Particularly, these questions cannot be easily addressed if this regulation issue revolves around a scientifically controversial and uncertain one. Building on a detailed study of the so-called "South Korea mad cow crisis," this paper examines how this globalization context surrounding the food safety regulation shaped the terrain of risk politics. In 2008, the South Korean government decided to lift the ban on U.S. beef and shortly after, as many as one million citizens took to the streets, each holding a lighted candle to protest this policy. The demonstrators were concerned not only about the possible risk of "mad cow disease" in U.S. beef imports but were also disturbed by the Korean government's decision supposedly to yield their inviolable "quarantine sovereignty" right. Although some critics claimed that the Korean government abandoned the responsibility to quarantine and isolate suspicious imports, this paper aims to fully explore and unravel the global context rather than finding a source of blame. This paper, following the actors' diverse interpretations of "quarantine sovereignty" and "precautionary principle," shows that these globalized dimensions of food safety regulation cannot be grasped by one cursory glance. It argues that in the beginning, this issue is inseparable with the Korea-U.S. Free Trade Agreement (FTA) negotiation and so should be addressed through other perspectives unlike the science-politics dichotomy framework, which all the actors including scientists and policymakers undoubtedly shared.

Peanut Butter Politics: Managing Risk in Food Nutrition and Safety. *Angie Boyce, Cornell University*

In this paper, I compare two episodes in which peanut butter, a mundane food product, became the center of intense regulatory and public attention in the United States in 2009 and 1966. In 2009, peanut butter paste manufactured by a family-owned Southern company was contaminated with the microorganism Salmonella Typhimurium. This company distributed its paste to hundreds of food corporations who used it to make thousands of products. When the contamination was discovered, these thousands of products were (voluntarily) recalled, resulting in the largest product recall in US history. Nineteen thousand people were estimated to be sickened, and 8 died, most of which were children or elderly. Subsequently, the House of Representatives Energy and Commerce Committee on Oversight and Investigations held a hearing on the incident to review the effectiveness of the Food and Drug Administration (FDA), the agency responsible for the regulation of food safety in peanut butter. Members of Congress berated the company at fault while also implicating the failure of the regulatory system to catch the problem. Consumer advocates called for substantive regulatory reform, with family members of the afflicted victims adding moral weight to these calls in grief-stricken testimony. While no single crisis precipitated the earlier episode, in 1966, the content of peanut butter was called into question during a standards-of-identity rule-making hearing at the FDA, when industry actors, regulators, and consumer advocates battled over which ingredients should be allowed to comprise a standardized definition of the product. While subsequent scholarly discussions of the hearing have dismissed it as a narrow debate on the proper percentage of peanuts in peanut butter, my analysis shows that broader issues were also at stake, including the politics of nutrition and safety. Key concerns for consumer advocates were hydrogenation and allergenicity. My paper analyzes and compares the two hearings from 2009 and 1966, focusing on the co-construction of peanut butter as a risk object, in relation to making of the consumer as an at-risk subject. Though I focus primarily on the discursive constructions in the hearings, I contextualize the hearings within larger policy and public discourses on regulation and de-regulation, as well as the changing structures of food production and consumption. I argue that the risk object & at-risk subject framework can help to transcend the production-consumption divide in food studies, while providing a way to link food studies and STS.

Technological Risk and the Vulnerable Child in Japan. *William Bradley, Ryukoku University*

This paper focuses on the figure of the child in Japan as a vulnerable object to discuss and image risks related to food and new diseases. While both food and disease are technological hybrids, connected to changes in production and consumption patterns and circulation of goods and humans, and thus risky in relation to the perceived 'natural' innocence of children, a counter trend can be seen in increased reliance on other technologies to protect children, such as mobile telephones and surveillance cameras in shopping and city centers. This paper analyzes how the child has come to be important to perceiving and understanding risk in Japanese society. Food panics have taken place over the past decade with regularity in Japanese society. These include, among others, imported foods with higher than allowed levels of chemicals, mislabelled foods (of foreign origin, labelled as domestic, or of foods with expiration dates that have already been passed being altered), and the BSE U.S beef import ban. In many of these cases, the everyday person who is potentially affected, is pictured in media as a housewife, who describes the risk to her family and children, using phrases, such as "I have children so " Similarly, a dominant scenario in the outbreak of new diseases such as the H1N1 virus in 2009 illustrates how risk is focused on children (additionally as they have contacted the virus in higher numbers through school and group activities). Throughout the spring of 2009, children who had contacted H1N1 were either quarantined or ordered strictly to stay home by school and local health authorities. These cases illustrate the framing of food and health risks around the notion of the child as a vulnerable object. In this paper I explore multiple explanations for this; among them, 1) the macro sociological focus on the falling birth rate and the declining numbers of children in Japan 2) the passivity of children as objects to be cared for in Japan 3) the framing of risk in comprehensible ways that make it easier to act in accordance with risk avoidance strategies in the first instance. However such risk avoidance, namely avoidance of technological risk induced by new food and disease, is contrasted with a reliance on technological fixes for other kinds of risk. In one example, many younger children are now encouraged to carry cell phones, not only so that they can be in contact with their parents, but also due to the GPS function that will identify where they are at any time. I link this discussion to the 4S literature on expert vs. lay interpretations of risk (Blok, Jensen and Kaltoft, 2008; Wynne 1996) and the development of risk identities in media representation (Cottle, 2006) and social roles that allow for technology to be naturalized in the face of crises so that alarmism does not become the dominant response. On the other hand, the multivalence of risk events allows for some responses that are unstable and lead in different ways than expected.

200. Comparative Differences: Global Technology

10:45 to 12:15 pm

5: 512

Participants:

How social and cultural difference interfere with the competition situation of Chinese search engine industry. *Chen ZiFu, ShangHai JiaoTong University,China*

As an typical East Asian country, China has its own long-standing and well-established culture and different social institutions in comparison with main western developed nations. At first, China not only opens the commercial market to global search engine provider, but also attempts to integrate his intrinsic social and cultural style into Internet spirit smoothly. So there are many cyber manhunt cases in China by public search engine service with the help of manpower concerned in recent years, at the same time the most popular local search engine company : Baidu go to public in NASDAQ, he attracts much attention from capital market and has a strong appeal to ordinary web surfers in China. So Baidu and Google become the super star in Chinese

Internet field. Both companies compete for the web flows and target customers in recent years. They occupy more than 80% market share in China within the restricted Internet regulated atmosphere. Outwardly both company manage to understand the Chinese local social and cultural situation and style. But in the end of 2009, Google suddenly claimed that he will give up Chinese market because of Internet policy regulation and organized hackers attacks. It seems that Baidu will benefit from this event. But in fact, many media and surfers criticized that Baidu play an important part in regulating Google's competitive behavior, So this event aggravates this accusation. "Don't be evil" is the slogan of Google, but he can't benefit from this exit too. Google will lost many loyal customers in China. Nobody can be winners in this long race. It seemed that this industry has entered into Prisoners Dilemma. Why happened to Chinese search engine industry? The reasons for this can be explained in many ways. But this article will indicate the social system and cultural difference would cause this situation. Essentially cultural difference maybe play more important role. We investigate and analyze some key events in Chinese Internet regulation process, it reflects that China follow the traditional ways to admin the Internet. It means that administration officers will regulate Internet step-by-step, if search engine provider can understand the local culture and know the timing in developing market, he can handle the situation without insurmountable difficulties. So if we understand the basic thoughts in Chinese local social cultural influences, global and local search engine providers will find some market niche for them.

Ubiquitous computing, new media and the social construction of urban experiences. A case study in the contested development of Bluetooth commercial advertisement in the Paris subway. *Christian Licoppe, Telecom Paristech*

The current development of ubiquitous computing raises new possibilities for embedding ambient intelligence in urban public spaces. This communication is based on a STS-inspired case study (Latour, 1992) of a collaborative innovation project dealing with the implementation of Bluetooth devices in subway stations to enrich current mural ad campaigns with capacities to 'push' relevant multimedia content (such as the video trailer of a new film release featured on a paper ad) on the users' mobile phones and PDAs. We study in more detail the association and translation work involved in three interrelated significant issues for the project and its co-shaping of the technology and the experience of a public place such as a subway station : where to place the Bluetooth devices? Should the devices be connected into a distributed digital network able to constitute and archive users' behavior and profiles? How to qualify in a juridical perspective the mobile phones' Bluetooth identifiers the use of which is required to detect, 'recognize' and send messages (even permission-requesting messages) to subway users? We show how the negotiations, controversies and tradeoffs elaborated in these trials display a deeper and more general tension between two modes of constituting and legitimizing the accessibility of mobile users in public places, respectively based on spatial proximity and connectivity, the mass treatment of anonymous passengers and the recognition of singular mobile bodies, the subway station as a non place, and the subway station as a multiplicity of heterotopias.

Multiculturalism on the Internet, possibilities and limits: the Korean domain name system case. *Jin-rang LEE, Dong-guk university*

With the development of ICT, human language tends to take a central place as a tool of content access which is not neutral reflecting social cultural contexts. It is the multiculturalism considered by the defenders of this aspect as a solution face to the disappearance of many languages. Firstly, we should mention that supporting multiculturalism paradigm is not so natural contrary to what we imagine. According to Andrea SEMPRINI (Le Multiculturalisme, 1997), this position was borne from the epistemological turning point that took shape in Europe since the 1920s as a reaction to positivism, rationalism and determinism. Many works of this current like HUSSERL, BARTHES, GREIMAS, LEVI-STRAUSS and FOUCAULT for example emphasize the specificity of the concept of culture and valorize the role of actors in the production of social facts. This is now supporting in the technology field equally by some European sociologists like M. CALLON, B. LATOUR and W. E. BIJEKER in terms of the social construction of technology or "Démocratie technique". The domain name system originally designed only by ASCII (American Standard Code for Information Interchange) moving to the multilingual system is a good example to show how this paradigm is supported in the information society. IDNA (Internationalized domain name system in applications), a code converting system proposed by IETF (Internet Engineering Task Force) with ICANN (Internet Corporation for Assigned Names and Numbers) in 2002 is a case in point. The Korean language is one of those who are benefiting this international movement. In effect, since 2002, the IDNA permitted the Koreans to have the Korean domain name as hangul.kr. With the creation of this international standard, the public's interest for that was great at that time (2003) in Korea where people expected that multi-lingual domain system made it possible for users to access Internet through hangul, notably for the aged users, not accustomed to the English. A decade after, a Korean journal notes a poor use of this hangul.kr in the market and public sphere (hangul.kr, even the government ignored », Etnews, December 17th 2009). Our goal is to examine why this new system in favor of Korean culture does not see a success. It could be precocious to say that now when we consider the ongoing international negotiations within ICANN and the technical development. However, the observation of last decade makes us not ignore other causes but technological one. Because we know the beginning of hangul.com service in 2000 generated lots of conflicts between the Korean industrial actors and the Americans supporting different logics, cultural patriotism vs. market liberalism. To find other causes beyond the technical problem, we intend to examine firstly some articles of the Korean newspapers and the statistics offered by Internet Statistics and Information System. Secondly around ten interviews with the Korean actors in this question, like Korean domain name system service providers and researchers in KRNIC (KoRea Network Information Center) and Jinbonet, a civil society specialized in human rights in the Information society, are expecting.

Enterprising Citizens and Co-production. *Kai Eriksson, University of Helsinki*

This paper focuses on the political implications of electronic governance or 'e-governance' in view of the emergence of what can be called 'self-service democracy'. It investigates the interlocking dynamics of the use of network technology in public services, and the objective of making people more responsible and accountable for their decisions. This takes place in the context of the reorganization of public services around the ideas of 'citizen demand' and 'co-production'. The emergence of self-service rationales with regard to the relationship between the state and its citizens appears at first sight to be unrelated, but this is not the case. In fact, comprehended in broader terms, the shift of western democracy towards self-service democracy is inseparable both from attempts to render the citizenry more independent and from the spread of information technology in both public administration and society at large. While the increasing use of information technology contributes to transferring governance from the domain of institution-based politics to a consumer-driven one, it also makes it possible, and even necessary, for the polity to rearticulate its strategies in terms of the new network-world. This also has some fundamental political implications: if politics is defined by the possibility of disagreement, as has traditionally been the case, it is important to examine how these developments and initiatives in networked governance do or do not narrow the area of politics. The paper thus attempts to outline the main ways in which the methods and practices related to the idea of self-organisation, in particular in the form of co-production, and the move to 'activate' individual citizens have increasingly become an integral part of the

practices and aims of political governance in many Western democracies. At the same time, it argues that political electronic mediated activities should be examined within the context of broader social and political formation: that of the self-service democracy.The paper aims at conceptual clarification and the creation of new concepts, thus its methodological approach is not empirical but rather theoretical. Yet it does not use any particular 'theory' in its orientation, although Foucault-inspired governmentality-studies are close to the approach used here. The paper contributes to STS literature by investigating how a certain discursive field, a set of information technology applications and forms, a particular governmental approach aiming at activating people, and also certain public initiatives and demands have together started to determine and organize the articulation and strategies of public policy in many industrial countries.

201. Standardization & Technological Skill Transfer

10:45 to 12:15 pm

5: 513

Participants:

Standard Setting in the History of Technology: A Case of Prewar Japanese Aviation. *Takehiko Hashimoto, University of Tokyo*

Since its invention in 1903, the airplane developed swiftly and greatly in performance and capacity. Lighter component materials, more powerful engines, and better aerodynamic forms - all contributed to the technical progress of the airplane. Behind such visible technological developments, standard setting, though invisible to the public, played an important role in enabling engineers design and manufacture lighter, safer, and more efficient airplanes. The proposed paper will investigate on the development of the standard on the strength of the airplane in interwar Japan, and attempt to show that prewar Japanese engineers were strongly concerned with the problem of standardization and their new standard provided a foundation for the wartime development of Japanese airplanes. The project of the transpacific flight was planned at the initiative of the Imperial Flight Society and involved engineers at the Aeronautical Research Institute of Tokyo Imperial University. Under their leadership, Kawanishi Aircraft Manufacturing Company attempted to make an airplane to fly over the Pacific. The project, however, ended up with the failure. A part of the reason was due to the strict enforcement of the standard of strength by the Aeronautical Bureau of the Japanese government. Kawanishi engineers claimed that since the airplane was to fly only once for the designated route, the airworthiness standard of the Bureau did not have to be applied as it is. But the claim of the Kawanishi side was unaccepted, and the project was discontinued. The experience with the failed transpacific project led one of the ARI engineer involved with the project, Hidemasa Kimura, to consider and analyze the function and foundation of the aeronautical standards. He recognized a conflict between efficiency and simplicity inherent in standard setting, and based on the comparison between American and German standards, evaluated highly the German standard which was more complicated but more efficient. Around that time, the Aeronautical Office of the Japanese Imperial Navy invited an American engineer, Joseph Newell, to deliver a lecture on the strength of the airplane and its American standards to naval, academic, and corporate aeronautical engineers. To design and develop its own original airplanes, the Japanese engineers needed to construct its own standards of strength and airworthiness. After the lecture, its participants soon became responsible for creating a naval standard of strength and designing experimental airplanes for the navy. The presentation will conclude with some historiographical implications concerning Japanese technology as well as the nature and significance of standardization in technological development.

Standardizing Car Sound - Integrating Europe? The Circulation and Appropriation of Knowledge on Car Acoustics. *Stefan Krebs, Eindhoven University of Technology*

From the 1950's onwards road traffic has become the most significant noise source in human environment. Since then, traffic noise abatement has been high on the agenda of European regulators and engineers. Particularly for engineers, the development of new measurement instruments, the standardized setup of the test equipment, and the imposing of noise limits for different vehicle categories were crucial to tackle the noise issue. To approach the noise problem the International Organization for Standardization (ISO) recommended a first standard on noise measurement in 1961: recommendation 362 - a norm that tried to combine subjective and scientific noise judgement. At the same time, the Organisation for Economic Co-operation and Development and the European Economic Community started to argue about joint measures to reduce traffic noise. Despite these efforts, the bi-annual conferences of the International Federation of Automotive Engineering Societies (FISITA) show that noise abatement entered the automotive engineering discourse not before the 1970's. Furthermore, the conference papers reveal the different national appropriation of ISO 362 and the diverting interests within the engineering community. By focusing on the FISITA conferences, my paper will trace the circulation of special knowledge on car noise measurement and reduction in the international engineering field. The observed differences in the appropriation of ISO 362 questions the assumed European integration in traffic noise abatement. While looking at the car as a one of the key consumer goods and the circulation of knowledge on car acoustics the paper will discuss two of the general fields of the Tensions of Europe's (EUROCORES program) intellectual agenda: 'Constructing European Ways of Knowing' and 'Consuming Europe'.

The challenging issue of safety for car makers with a focus on BMW. *Marine Moguen-Toursel, INRETS*

Vehicle safety has a long story: from the very beginning of car production, manufacturers were interested with safety issues. They did not wait for regulation or wishes expressed by consumers. They considered it as one aspect of car production, and developed innovations and equipments in the same time as they tried to raise the maximum speed that the car could reach. Vehicle safety can be divided into three different types: active safety (equipments for avoiding accident), passive safety (equipments for reducing the consequences of an accident) and compatibility of vehicles (aggressiveness of highly equipped vehicles towards ordinary ones). These can be considered as successive waves of vehicle safety even if there are some overlaps. But as an overview it can be said that active safety became a concern for most car makers since the 1930s. Passive safety was considered since the 1950s. And vehicle compatibility is still a challenge for today. Each phase was linked with special scientific material to assemble, technical problems to solve, strategies to develop or to stop, co-operation or competition with other car makers, and eventually regulation to take into account. BMW is an interesting case of a German sport producing company which was very involved in active safety since the 1930s. More important active safety innovations came from the aeronautics, especially for vehicle stability and braking qualities. It is interesting to investigate research and tools coming from aeronautics as well as eventual co-operations with some firms of the sector. Later, people working at BMW were very reluctant to passive safety which was not part of the technical culture of the firm. When the US Department of Transport launched the Experimental Safety Vehicles project in 1970 in the NATO framework, the firm only proposed a simulation but did not want to build any prototypes or make any advanced studies. Neverthless the firm could not refuse participating in this project because it had decided to extend its market share in the United States. A unit dedicated to accidents was only constituted at BMW in 1978. Before these fields were treated by the regulations unit. For this chapter our main goal is to explain why the introduction of passive safety inside the firm was delayed. For the chapter on vehicle compatibility, we are trying to determine if the expensive cars produced by BMW are more effective on safety equipments and innovations than smaller and

less expensive ones. This point was debated by experts. Statistics and scientific contributions (for instance at the Conference of Washington in May 1972) can bring interesting lights on the debate. Additionally the question is to know if cars fully equipped with safety equipments can endanger other cars on roads. This contribution is based on archives (in particular in the French Committee of Car Makers) and interviews realized with salaries of the firm for a current research on road safety in Germany.

Integrating Science, Technology and Society (STS) into Engineering Education — an Action Research Approach in Taiwan. *Wen-Ling Hong, National Kaohsiung Marine University*; *Jr-Ping Wang, National Kaohsiung Marine University*; *Jeng-Horng Chen, National Cheng Kung University*

Science, technology and society (STS) has become a part of college education in many western education systems, including engineering. However, only until recent years, inter-disciplinary fields between engineering and humanity/social science like STS have received slight attention in the engineering education systems in Taiwan. Three junior engineering professors from two universities formed a team to research ways to introduce STS into the college level engineering education. The team members have naval architecture graduate studies background, are also part of the teaching staffs of two STS projects in the engineering colleges in both schools. These STS projects are funded by the Advisory Office of the Ministry of Education, Taiwan, aiming to promote the implementation of STS courses into those traditionally self-contained disciplines like science, medicine, agriculture, engineering, etc. The researchers took the action research approach towards this subject. Since 2007, the researchers meet regularly to exchange, compare the project outcomes and discuss further actions. The STS projects are then revised and reshaped often to reflect the discussions. The courses' names, their contexts, the placements of these STS courses, the dynamics of the team members with other engineering faculties, and the collaboration with school's administration are some of the key factors adjusted constantly in this research. In this paper, we discuss the learning course of STS for engineering professors, the processes of developing STS courses for engineering students, the placements of the STS courses in the school's curriculum structure, and ways to help the sustainability and acceptance of STS in the engineering education system. For example, owing to the trend of engineering departments getting accreditation from the Institute of Engineering Education Taiwan (IEET), the so-called non-hard-core skills such as team-working, life-time learning, critical thinking, abilities to consider engineering in the social context, etc. are to be included as parts of the engineering training. The course "Engineering Ethics" has received much expectation to be able to provide almost all the above abilities. This became an entry point for the team to re-interpret "Engineering Ethics" with local cases and STS theories. Currently, we are actively involved in STS research and promotion in Taiwan. We have raised the visibilities of STS subjects in the engineering discussion and acceptance of STS courses from the students and faculty members as part of the regular curriculums. Several sets of courses including "Engineering Ethics (and Society)" and "History of (Marine) Technology" are developed with STS context with good students response and outcomes. We hope this research adds to the ongoing efforts in integration and collaboration of humanity, social science and engineering, and promotion of engineering education quality as well.

Unraveling Technological Discontinuity: An Institutional Perspective. *Yutaka Yamauchi, Palo Alto Research Center*; *Eric Giannella, Stanford University*

Much scholarship on technical change has postulated that attempting to transition from one research domain to another is inherently difficult due to path dependent learning. We argue that in addition to considering the investment required to learn new technical material, social scientists should devote greater study to the institutional factors that can both motivate and deter a collective effort among scientists to transition into a new domain. In this study we report the case study of Palo Alto Research Center (PARC), often known as Xerox PARC - a research lab that historically contributed significantly to user interfaces, personal computing, and networking. We interviewed over twenty scientists and managers, analyzed various documents and observed the work of selected scientists. Scientists who had worked on printing, laser scanning, toner, and optics moved into domains completely new to them such as clean technology and biomedical devices. As institutional theory predicts, we find that during periods of uncertainty latent cultural interests are more likely to rise to the surface and translate themselves into research efforts. Projects with culturally sanctioned research goals often received free labor from other scientists and are granted much more organizational room to fail than those projects that do not benefit from the same level of cultural legitimacy. Yet, institutional challenges also arise due to unexpected field-specific norms and a legitimacy penalty that scientists incur for pursuing what is perceived to be discontinuous work. We illustrate that scientists often try to strategically select what we term 'boundary problems' that are considered important and legitimate in the new domain. At the same time, scientists must believe that the boundary problem may be addressed using their existing expertise, thus representing significant continuity in the actual knowledge used before and after the transition to a new technical domain. We illustrate how scientists at PARC tried to address institutional concerns of various stakeholders, including funders, colleagues, and technical experts in the new domain as they pursued their interests in clean technologies and biomedical research.

202. Anomies of Science

10:45 to 12:15 pm

5: 514

Participants:

The Yuk Factor: Repulsive Science, Disgustful Techniques and (De)civilization. *Rafael Jorge Marques, ISEG and SOCIUS*

Abstract: Science is a cornerstone of modernity and is usually taken as a symbol of progress and enlightenment, reducing human suffering and enabling longer, healthier and happier lives. In this particular sense, science is easily associated with a civilizing project. On the other hand, disgust is also a token of a civilized society. The moving thresholds of disgust and repulsion are clear marks of what the civilizing process means. Moving disgustful activities to the backstage of social life and experiencing revulsion at violence or bloody practices has been a mark of all civilization projects (à la Elias). But disgust is also caused by the breakup of traditional boundaries that established the foundations of social life (cf. Mary Douglas). Taking disgust as a measure of civilization, it can be argued that science and technology can both be seen as civilizing and (de)civilizing mechanisms. By suppressing the traditional boundaries of the artificial-natural divide (vg prosthetics, synthetic meat) or the human-animal partition (vg xeno transplants), medical, biological and chemical sciences have entered the realm of disgust. By playing godlike activities (vg cloning, chimera creation), science has assumed a quasi religious role in today's societies, causing repulsive reactions in many cultures and societies. I'll argue that science redefines traditional boundaries and is helping to redraw the cleavages that supported most of our civilization concepts. Thanks to its pervasive nature and capacity for self legitimation, science will be a major institutional force in the (re)construction of the concept of disgust. To conclude, I'll present the yuk law, stating that no moral or legal interdiction has more than a deferment power over the development of a new technique, regardless of the reactions it causes. All that is made possible by technical devices or scientific principles will eventually make their way to the real world. Disgust will be reworked in such a way as to be considered condemnable but possible, first, acceptable under certain circumstances, later, generally accepted

after a few years, afterwards, ending up being defined as normal or even laudable.

Changing Forms and Formats of Scientific Communication in Sociology Journals. *Raf Vanderstraeten, Ghent University, Belgium*

Scientific specialisation seems first of all an intellectual orientation of particular individuals. It depends on a decision to focus on a relatively small field of scientific activity. But, as is the case for any such decision, individuals need a social context supporting it, that is, other individuals taking the same decision. Such decisions were still rare around the middle of the eighteenth century, when encyclopaedic orientations dominated among professional and amateur scientists alike. But they gained prominence in the last decades of the eighteenth and at the start of the nineteenth century. Specialised disciplines then became the predominant structure of the scientific world. The rise of disciplines is connected with the formation of groups/networks of specialists. It is connected with the emergence of 'scientific communities' - theorised about since Thomas Kuhn. But how is such a community of specialists brought together, how are common orientations among members of a scientific community upheld? In some recent STS-literature, attention has been directed to the rise of new forms of scientific communication, especially in specialised scientific journals. The establishment of specialised journals facilitates the formation of networks of (potential) authors. These journals and the publications therein 'control' the formation of scientific disciplines. The authors of articles accept the specialisation chosen by the journal, but at the same time they continually modify this specialisation by the cumulative effect of their published findings. Seen from this point of view, scientific publications - first embedded in national, afterwards in supranational networks - are central to intellectual specialisations and scientific disciplines. In this presentation, attention will be focussed on the evolution of communication practices within the sociological discipline - especially within the Dutch-speaking part of Europe. In the first part, I will introduce and clarify the theoretical rationale of my approach. Afterwards, I will present and discuss empirical (historical and quantitative) data that shed light on basic changes in the communication practices within sociology. I will consider both general characteristics of publications in sociology journals, and 'national' particularities related to the shift from national to supranational networks in the Low Countries. This way, my paper also aims to contribute to a more reflective orientation in sociology, to a sociology of sociology.

Anomie in Academic Science. *Joseph C. Hermanowicz, University of Georgia, USA*

This paper examines the development and conditions of anomie in contemporary academic science. Elaborated by the classic sociologist, Emile Durkheim, anomie is a theoretic concept that refers to a collective breakdown of order brought about by a divide between the realities of everyday situations and the needs and wants for a future. Durkheim contended that when social systems undergo major, transformational shifts in their structure, serious institutional and individual consequences arise. Highly significant structural change characterizes the present and ongoing situation in the system of American higher education. When social systems experience significant alteration, they may fail to provide meaningful maps by which to guide interaction and thus meaningful bases by which to establish understanding about roles, expectations, and aspirations in the academic profession. In science, anomie may be specified as an absence of opportunities to achieve recognition: anomie is the result of a divide between individual achievement aspirations and a profession's capacity to recognize individuals for their contributions. The study is based on a longitudinal design in which scientists—in early, middle, and late career, and employed in a spectrum of U.S. universities—were interviewed by the author first in 1994-95 and again in 2004-05. Scientists were originally sampled by departmental rank as measured by assessments of graduate programs conducted by the National Research Council. Top, middle, and tail-ranked departments were selected and incorporated into the study design to permit a comparison of careers that are experienced under different structural and cultural conditions. The three professional age cohorts were established by the year in which scientists received their Ph.D.'s, which is used as a proxy of their career stage. The paper (fully drafted at this writing) and related work represent the first study of occupational well-being to track the same members of a profession over time. The longitudinal data permit an examination of the effects of accomplishment (and lack of accomplishment) on personal well-being. Scientists were studied for the satisfactions and dissatisfactions that developed in their careers and how they perceived progress toward professional goals. The paper contributes to both institutional and intepretivist literatures in the sociology of science by examining the ways by which scientists meaningfully construct careers. The analysis develops prior structural concerns with recognition and cumulative advantage to understand how variously rewarded careers are understood by scientists as agents in their own evolution. The paper is organized by three goals. First, drawing upon sociological theory, the author outlines a conceptual framework in which to examine anomie in American academic science. Second, the ways by which anomie varies in the contemporary era are examined by career stages of scientists, by organizational types of higher education institutions, by scholarly field, and by historical time. Research findings indicate an intensification of anomie in American science, which may inform patterns in other national settings. Finally, the implications that anomie presents to the status of science as a profession are discussed, as are prognoses of the future vitality of American academic science.

203. Professional Development: 6S Student Activity II

10:45 to 12:15 pm

5: 516

This event is intended to explore the various stages of professional development such as: (a) Attaining research grants, (b) getting a post doctoral position, (c) Jr. Faculty positions, (d) the role of conferences and publication in professional development, and (e) alternative professions beyond academia. With such breadth we hope to touch upon the various stages in the life course of professional development. Participants will include junior scholars who have recently broken into the field. They will share their successes and travails, and provide advice on the "little things" that can make a big difference.

Chair:

Nicole Nelson, Cornell University

Discussants:

Michael Lynch, Cornell University
Atsushi Akera, Rensselaer Polytechnic Institute
Nelly Oudshoorn, University Twente
Sungook Hong, Seoul National University
Kenji Ito, The Graduate University for Advanced Studies

204. Re-imagining technology control in national security

10:45 to 12:15 pm

5: 521

As the technologies that are employed in security and intelligence applications continue to advance in their complexity and integration with wider systems, two meta-level shifts have become apparent. First, it is increasingly difficult to draw boundaries around a particular technology in a way that would make it easy to control who has access to it and what they may do with it. Second, these integrated and increasingly autonomous technologies are themselves governing the development of new processes for intelligence work and security/military operations. Both of these developments draw on the ambiguity in many technologies that allows them to be enacted differently by different groups of people. In this session, we look at several ways to re-imagine what it means for technology to be controlled or controlling in today's security, military, and intelligence environments. The papers draw on a range of perspectives within STS and highlight some concepts from other fields that the authors have found useful in their analysis. Authors are expected to have engaged

in significant dialogue with the subjects of their research, with the intention of creating a shared knowledge environment with the subjects, upon which the authors also reflect. This session draws on the significant interest at last year's 4S conference in issues related to security, terrorism, military, and intelligence issues. Many sessions last year had a focus either on practitioner perspectives of STS concept deployment in their field of work, or academic STS analysis of practitioner settings and procedures. In this session, we encourage the participants to reflect on how academic analysis and practitioner concepts may recursively inform each other's work.

Participants:

High and Low: The technologies of prolific offender management and the new police work. *Michelle Stewart, University of California Davis*

Based on fifteen months of ethnographic research with police in one Canadian province this paper will consider the ways in which the introduction, application and translation of new policing technologies are shifting the notion of "police work" and transforming the relationship between police, the public and security. Mobilizing STS-inspired analysis this paper will consider "police work" as a network and trouble the notion of exportable technologies. "The Prolific Offender" is an emerging criminal subject mobilized in transnational policing practices that blend high and low technologies. Developed first in the UK, prolific offender programs are informed recursively through Criminology discourses that assert each community has "repeat offenders" that produce a disproportionate amount of crime. The vision of prolific offender management is to target these individuals and to intervene on their lives to break "cycle of crime." Prolific offender management targets the top 5% of the repeat offenders (including youth) with enhanced police scrutiny, alongside "wrap-around services" in which various policing and social agencies converge to intervene. The desired result is highly individualized surveillance and control technologies coupled with the offer of social assistance to those predicted to be the greatest criminal threat. The scope of individuals enrolled in this program ranges from property criminals to known and associated gang members. The prolific offender program ends up triangulated in local, national and international security techniques, as the figure of the prolific offender is mobilized in calls for sweeping criminal justice and social service reform, resulting in increased surveillance and stiffer penalties being conveyed upon those evaluated as presenting the greatest threat (if only anticipated). The prolific offender program is hailed as a new era in policing that is focused on "evidence-based" and "intelligence-led" policing. The importation of the prolific offender program from the UK to Canada has brought about not only a shift in policing practices and rhetorics of discipline and surveillance but has also fundamentally shifted the workforce. Prior to the introduction of the program, this Canadian province had less than 20 crime analysts. These analysts are classified as "civilian" police officers, a special classification that makes them "not quite" police officers, yet they are meant to provide the intelligence analysis that leads police work. This unique configuration of civilian police working with traditional police officers has resulted in a set of tensions surrounding the application of desired police practices that require the "expertise" of analysts in the office and officers "working" the streets. There will soon be 100 analysts populating small and larger police departments and these same tensions continue as the understanding of what constitutes "police work" are being renegotiated. In this arena, "police work" is being operationalized within a larger network of practitioners who blend "high" technologies (crime mapping, hotspotting and other analysis) and "low" technologies (personal surveillance, interviews etc) to bring about the desired policing practice of the day that itself continues to inform and be informed by theories in criminology.

A Seamless Web: Sharing information and securing the nation. *Meg Stalcup, Fred Hutchinson Cancer Research Center*

Since 2004, the US government has been working to spin information into a "seamless web of security." The Information Sharing Environment, or ISE, was established on the recommendation of the 9/11 Commission, by Executive Order and congress's Intelligence Reform and Terrorism Prevention Act. The Environment is intended to produce an (equally seamless) network that shares "law enforcement," "homeland security" and "terrorism" information, each duly defined. The objective is to take this tidily codified information and weave it together using common standards and collaboration technologies into a shared national effort. From the ground level of police suspicious activity reports on one end, to the National Counterterrorism Center on the other, the ISE is supposed to embody the much-touted shift from "need to know" to "responsibility to share." Yet, considering information sharing as a form of secrecy (Aftergood), that which is actually freely available does not need to be shared. The phrase thus obscures the question about where the information comes from: in practice and policy, the technologies of information sharing are those of domestic intelligence. The ISE is built through collecting and controlling information, creating boundaries such that information flows through authorized and regulated channels, but cannot be seen outside them. Drawing on fieldwork at an intelligence fusion center in California, as well as interviews, primary documents and secondary literature, the paper will briefly explain the Information Sharing Environment and how it is intended to link street-level data from patrol officers with federally-informed strategic analysis. Then, taking up the STS concept of technology as not just software or equipment, but equally, the practices and techniques required to gather, collate and analyze the information, this paper will explore how the ISE aims to change police practices, and the implications of "keeping the peace" as a domestic security and intelligence practice for practitioners and the public alike.

Sensing the Truth (Remotely): War Imagery and Technologies of Surveillance in Sri Lanka. *Vivian Y. Choi, University of California, Davis*

My paper begins with a very public dispute between international news reporting, the United Nations, and the Sri Lankan Government during the final stages of the civil war in Sri Lanka in May 2009. At this time, Sri Lankan military forces were closing in on the territorial strongholds of the Liberation Tigers of Tamil Eelam (LTTE). International journalists and humanitarian agencies were barred from entering this shrinking area and the designated "safe zone" into which hundreds of thousands of Sri Lankan Tamil civilians were corralled. Hence, rumours flared: the Sri Lankan government claimed to be undertaking the largest humanitarian mission in history to rescue the civilians from the clutches of the LTTE "terrorists," while the international world felt it was possible that civilians were being bombed and killed despite the government's designation of the "safe zone." Frustrated the UN turned to satellite imagery and released photos that showed evidence of shelling in the so-called safe zone. The government, riled up by these accusations and increasing criticism from the international world, released their own "interpretation" of the images with their own remote sensing expert, summarily rejecting them on the basis that there was no "ground proof" to indicate that this was indeed the case. The "reality" presented by the Sri Lankan government, expectedly, was one that supported their war efforts. Using research from my fieldwork in Sri Lanka during this time, I will discuss how image and surveillance technologies simultaneously instantiate doubt towards state power while also eliciting and confirming it - in particular to those affected by the conflict, but not living in or near the safe zone themselves. In turn I ask: how does ambiguity allow different ground realities to emerge, and which ground realities come to matter, when experienced and viewed "remotely?"

Can a Robot be a Warrior? The Ethical and Other Implications of Trying to Program the Next Generation of Military Robots with a 'Warrior Ethos'. *Christopher Coker, London School of Economics*

At last year's 4S conference in Washington I drafted a paper called 'Can a robot be a Kantian?'. It addressed the ethical

implications of trying to programme robots with a conscience (a project associated with the work of Ron Arkin at Georgia MIT). This year I propose engaging with another project pioneered by the Office of Naval Research and its attempt to programme a robot with a 'warrior ethos'. Again I would like to explore the ethical implications of military robotics. Although Peter Singer in his book Wired for War dismisses Asimov's laws, I think they are central to our understanding of what it means to produce algorithms that are intended to give robots either a conscience or a warrior ethos (especially the latter). The paper I hope to give will be based on research I am undertaking at present, and will build on lectures I have given at a number of military institutions including the US Army War College and the National Defense University in the US.

The Martial Gaze: Perceptual Assemblages and the Striation of Battlespace. *Antoine Bousquet, University of London*

Concomitantly to the increasing destructiveness and accuracy of weaponry and the expansion in scale and geographic reach of military operations, modern warfare has witnessed a spectacular development in the scope, precision, and timeliness of the information-gathering mechanisms deployed by armed forces. Extending their reach across the electromagnetic spectrum well beyond the restricted portion of light visible to the naked human eye, armies seek to acquire precise and useable information about both their own forces and those of their adversaries, as well as the battlespace as a whole. The development of perceptual apparatuses is closely tied to the histories of both surveillance and the scientific mastery of the electromagnetic spectrum through the deployment of a wide array of technoscientific systems ranging from telescopic vision and photographic capture to radar, cartography and satellite geolocation. Drawing on the work of Deleuze and Guattari, this paper will focus the metrological process that underpins the emergence and operation of perceptual assemblages through an analysis of the striation of space they rely upon. The inherent limitations of this approach in the contemporary battlespace will also be considered.

Chair:

Samuel Evans, Havard University

Discussant:

Dan Plafcan, University of Virginia

205. Technological Innovation and Cultural/Global Contexts (1)

10:45 to 12:15 pm

5: 522

Participants:

Front load - brackish water: Social technologies for interventionist innovation. *Emil Røyrvik, SINTEF Technology and society*; *Arne Lindseth Bygdås, SINTEF Technology and society*; *Morten Hatling, SINTEF Technology and society*

In recent years the importance of "front-loading", defined as the identification and solving of problems, has received much attention in the field of product development and innovation. Systematic efforts of front-loading for example in the Toyota Motor Corporation has shown that problem-identification and problem-solving has shifted to earlier stages of the product development process. This in turn can reduce both development time and cost, in addition to freeing up resources that might be spent becoming more innovative. More generally the importance of the early phases in product development and innovation projects have been thoroughly documented. The present paper reports on an action research oriented case study from a high-tech industry tools manufacturers' product development and innovation efforts. Following closely through participant and non-participant observation a complex product development project through 12 months, from its beginning through to a fully developed prototype, the research documents how a focused front-loading strategy was chosen, how various social process technologies to facilitate innovation were utilized, and the implications of both. A major corollary to the front-loading strategy was that the period following the front-load became characterized by a "withering away" of both resources, results, participants and focus in the project - a kind of brackish water. To counter this the project introduced a collaborative and interventionist process called "peer resist" to function as something more than just a contrived milestone in a brackish water project - it had to function as a transformative happening, a social ritual, that left the project and its participants with more than head above water. The paper chronicles the events and contributes to STS both empirically, and in theory and method through developing a reflexive and interventionist approach to STS with collaborative counterparts. The paper provides a tripartite conclusion. First, the definition of "front-loading" should be expanded from its quite narrow focus as the identification and solving of problems. Front-loading should rather embrace the potentialities for change, break, new solutions and unthought-of possibilities embedded in early phases of product development and innovation projects and processes. This might turn front-loading into a creational and generative capacity for bringing forth the new. Secondly, the paper has highlighted the dilemmas and dangers of getting stuck in "brackish water" after a successful front-load period. After intensely focused periods, with high costs attached, a variety of constraints on the organization and its members, including no customer deadline, lead with high probability to a decrease in the development activity. This happened also in our case. This leads to the papers third and final conclusion. Interventionist action and technologies might successfully be utilized to escape the post-frontload brackish water condition, but doing so without exhausting or disillusioning the participant requires consideration. Based on the interventions carried out in the case study three such considerations are highlighted in the paper: resource allocation and availability, enabling collaborative work practices, and managerial focus and leverage. We conclude our paper by arguing that important aspects of these considerations can be given impetus and facilitated by means of social technologies.

Techno-nationalism,--- Japan, USA and China. *shigeru nakayama, Kanagawa university*

In the 1980s, techno-nationalism was treated as one of Japanese ideology. It had conflict with American science bureaucrats in late 80s. After globalization in the 90s, techno-globalism became prevalent to techno-nationalism in MNCs. Now, the attention is centered around Chinese techno-nationalism. It was domestically appeared as techno-national public (military) sector vs. techno-globalism in private economic sector. The ideological aspects of these words are conceptually straighten up.

Bureaucrats' regress: Interagency negotiation in the making of nanosize standards. *Sharon Ku, National Institute of Health, USA*

With our heavy dependence on science and technology, the scale of contemporary scientific research becomes larger and costly. Increases in government investment and regulation indicate that science, though considered as a laboratory-based activity full of situational contingencies, contains formal bureaucratic practices within a complex organization. This paper attempts to provide a sociological account of the role of bureaucracy as a knowledge maker, through a thick description of the operation of a research alliance formed by two U.S. federal government agencies—National Institute of Standards and Technology (NIST) and the National Cancer Institute (NCI)-- in the development of nanomedicine. In order to solve the problem of a lack of standard in nanodrug measurement, NIST and NCI signed a Memorandum of Understanding (MOU) in 2004 to create a nanosize standard. Unexpectedly, a series of disputes regarding the definition of the taken-for-granted notions-- "size" and "standard"—emerged during the process of collaboration. As a consequence, this "simple and straightforward" project originally considered by two parties gradually developed into a controversy over not only the scientific definition of a nanosize standard, but also science policy and questions about two institutes' bureaucratic responsibility. Finitists' account on rule-following in sociology of

scientific knowledge provides a sharp tool to study the entanglement between micro-level scientific practice and macro-scale bureaucratic order. I develop a theoretical concept called "bureaucrat's regress" to analyze this dispute. I argue that bureaucracy is a self-referential system: its operation relies on bureaucrats to correctly follow bureaucratic rules; however, what makes bureaucratic rules as obeyed orders requires the operation of bureaucracy to secure the collective practice of the rules. Following this thought, I first show that the operations and interaction of NIST and NCI should not simply be considered as static practices governed by the MOU. Instead, they represent a dynamic process where two parties have to constantly interpret the meanings of bureaucratic rules and adequately realize them to secure their institutional identity. Second, I demonstrate that the scientific and political cultures of these government institutes are mutually defined by the bureaucrats' regress. While defending certain definitions of nanosize standard, NIST and NCI simultaneously claimed their institutional identity and political responsibility. Through analyzing the mechanism two parties adopted to resolve the debate, I conclude that interagency collaboration requires neither the accurate instrumentation to provide a strict answer of the size standard, nor the high-level authority to execute the political command. It requires the establishment of a common social basis to break the regress. My third objective is to use this case study to provide a methodological reflection toward STS studies. The dynamics of the interagency negotiation shows that the finitists' account should be applied to both the analysis of science and bureaucracy. It thus defends the fourth tenet of the Strong Programme, reflexivity.

The Status Quo and the Deficiencies of China's Basic R&D Investments. *Guo-ping ZENG, Center of Science, Technology and Sociaty, Tsinghua.University*; *Xi-jie SUN, Center of Science, Technology and Sociaty, Tsinghua.University*; *Hong-lin LI, China Research Institute for Science Popularization*

Despite the accelerated increase in the overall R&D expenditures during the past years, the basic research share of GERD in China is as low as 5 percent compared with that of 15-20 percent in many developed and developing countries. Based on in-depth analyses of authoritative statistics, this paper reveals that China's basic R&D funding, which derives almost exclusively from central government (and even four government departments), lacks systematic coordination. Therefore, this paper proposes the formation of a coordinating mechanism, along with associated policies, for the funding of basic research. If instituted, this will result in enhancing the basic research spending efficiency, increasing the research investments, optimizing the R&D system, and in a broader sense establishing a national foundation for strategic research funding and the coordination of scientific initiatives.

206. Vital Legacies: Indigenous Body Parts and the Politics of Global Knowledge Production

10:45 to 12:15 pm
5: 524

In the mid-twentieth century, technological changes in transportation and preservation transformed the body parts of so-called primitive peoples into the material culture of biomedical science. As specimens, these materials circulate through networks of exchange that animate a global scientific community. As Warwick Anderson's history of Kuru has shown (2008), the mobilization of 'indigenous' specimens is a thoroughly biosocial practice, as scientific objects come to stand in for people or even entire communities. It is through ongoing and uneven processes of alienation, transformation and exchange that knowledge, status, and obligation are produced. This session aims to examine entanglements between populations characterized as indigenous with the scientists who introduced these body parts into global regimes of value. Specifically, the papers will explore and extend Anderson's arguments in examination of other cases - both historical and contemporary -- where indigenous bodily substance has served as a reservoir for research. We ask: What are the historical conditions of possibility that led indigenous body parts to become enrolled in an ongoing project of knowledge production about human health and identity? What are the material legacies of the hundreds of thousands of samples that persist in laboratory freezers around the world? What kinds of technical, ethical, and emotional labor are involved with maintaining these biorepositories? Similarly, what are the implications for how changes in experimental practice, such as PCR and DNA analyses, have led old blood to be used for new purposes? How have postcolonial shifts in value, such as the emerging idea of biological samples as individual or collective cultural property, reconfigured the relationship between scientists and indigenous people? What happens to exchanges when samples are presumed to be inalienable from their source or when they have outlived the bodies from which they were extracted? And how has the scientific circulation of 'primitive' body products been affected by a global indigenous movement's problematization of such practices? Moving from the lab to the field to the archive and back again, papers in this session will explore these questions from a variety of national perspectives. We aim to further our understanding of how science and technology, and biomedicine in particular, has become increasingly central to the modern constitution of difference, culture and global politics. Specifically, the papers will contribute to developing comparative perspectives in STS that link the biomedical practices and ideas which characterized the colonial frontier with contemporary scientific and cultural contestations for authority that shape today's frontier technologies of genetic science. By examining different national contexts (Australia, Canada and Colombia), the session will explore the tensions and continuities between 'colonial' projects that sought to map biological difference and new biopolitical arrangements and ethical negotiations at stake in the inclusion and participation of indigenous peoples within 'postcolonial' biomedical research. Devoting anthropological and historical attention to the traffic of indigenous bodily substance will reveal new dimensions of ethics, citizenship, commerce, policy and social movements in the postcolonial world.

Participants:

Taking Stock: Tissue Collection Practices in the International Biological Program, 1964-1974. *Joanna Radin, University of Pennsylvania*

Anthropological and natural historical collectors have long justified their efforts in terms of salvage: the attempt to metaphorically 'freeze' those artifacts, traditions, and languages in danger of disappearing into the past. In the Cold War era, justifications for salvage were re-articulated as new techniques emerged to change the forms of 'capture' by which specimens would be collected and maintained. The metaphor of freezing had become a reality in practice: new technologies of both mobile and long-term freezing enabled the collection of bodily substance in the field and its preservation in the lab. These technologies included special thermoses, portable mechanical refrigerators, dry ice, and liquid nitrogen. In this paper, I situate these changes in collecting in the history of the mid-twentieth century International Biological Program, a large-scale effort to take stock of the biosphere. IBP organizers stressed the sustained importance of fieldwork and collecting in an era they saw as both increasingly dominated by molecular approaches and threatened by the dark side of modernity. Inspired by the wildly successful International Geophysical Year and coordinated through a network of scientific unions, biologists from over 50 countries ultimately participated in the IBP, which ran from 1964 to 1974. Benefactors of unprecedented Cold War federal funding for science, American biologists were among the most influential contributors to the effort. IBP-related efforts crossed plant, animal, and human boundaries, as air travel and freezer technology lowered barriers to massive collection and salvage programs. IBP researchers focused on human adaptability sought to understand the selective mechanisms presumed to have enabled humans to evolve in different environments. In official IBP correspondence, technical reports, and public relations materials, prominent scientists such as James Neel and J.S. Weiner overrode skeptics to champion a sampling approach focused exclusively on 'disappearing' and 'primitive' communities. I describe how, in the context of IBP, intellectual preoccupations with obtaining genetic evidence from these remote communities combined with increased access to new transportation and cold

storage technologies. This frozen blood initially served as the basis for Nobel Prize winning research in epidemiology in the 1960s and has, more recently, been defrosted to function as the material basis for breakthroughs in anthropological genetics. My attention to the role of technologies of cold storage in anthropological fieldwork suggests that certain mid-20th century human adaptability investigators expressed their concern about the decay of human environments through efforts to freeze pieces of them. By considering the freezer in efforts to trace the relationship between researcher and subject, scientific ideals and practice, lab and field, I contribute to science studies scholars' understanding of the vital, material legacies of human subjects distributed in time and space. This work speaks to scholarship engaged with how diverse bodies become standardized in the production of knowledge about human origins and environments.

Orphan DNA: Indigenous samples, ethical biovalue and postcolonial science. *Emma Kowal, University of Melbourne*

Thousands of blood samples taken from Australia's indigenous people lie in institutional freezers of the global North, the legacy of twentieth-century scientific research. Since those collections were assembled, standards of ethical research practice have changed dramatically, leaving most samples in a state of dormancy. The provenance and use of old collections is assumed by some to be against the interests of past and present generations of indigenous people. While some European collections are still actively used for genetic research, this is viewed as maverick and unethical by most Australian genetic researchers who have closer relationships with indigenous Australians and postcolonial politics. For collections to be used ethically, they require a 'guardian' who has responsibility for them and who also has an ongoing and documented relationship with the donors so that consent to further studies on their samples can be negotiated. This affective/bureaucratic network generates 'ethical biovalue' such that a research project can satisfy Australian ethical review, which will usually include review by indigenous Australians. Without ethical biovalue, collections become 'orphan' DNA, divorced not only from a guardian but often from the ability to identify their sources. Such samples are orphaned but also functionally sterile, unable to produce data, scientific papers, knowledge or prestige. This paper draws on an ethnographic study of genetic researchers who are working in indigenous communities across Australia. It describes a visit to an indigenous community by an older genetic researcher and her younger colleague. Concerned about the fate of her DNA collection when she retires, she attempts to interest her colleague in the donors and their community. Finding an heir to maintain a network of affective ties will ensure the future productivity of her samples. Alongside this episode, I present other tales of researchers' efforts to generate ethical biovalue and their fears for succession, fears which extend to threats to destroy samples rather than see them orphaned, or worse, fall into the wrong hands. Within these material and affective networks, indigenous DNA morphs from biological sample to sacred object to political time bomb. The research described in this paper contributes to the anthropology of genetics, of scientific and medical research, of biopolitics and of bioethics. Positioned with the sub-field of postcolonial technoscience, it generates new insight into the relations between scientists, indigenous people, DNA, and their respective publics. It contrasts historical collecting practices, in which complete alienation of samples from their sources was the intention, with contemporary notions of bioethics where samples are treated as the extension of both the individual and the collective racialised body. In addition, the paper generates new insights into the role of gift, exchange and value in contemporary scientific practice.

Molecular vignettes of the Colombian nation: the place(s) of race and ethnicity in networks of biocapital. *Carlos Andrés Barragán, University of California, Davis*

Geneticists interested in carrying out genomic research in the Colombian Amazon ―whether biomedical or ancestry studies― face an unreceptive environment towards their goals and agendas, particularly when such projects require the participation of ethnic minorities. Certainly, such circumstance cannot be a surprise considering the long genealogy of scientific scandals in which geneticists and biological anthropologists have been exposed for unethical and illegal practices where the socio-cultural and biological wellbeing of several ethnic groups has been compromised. While this situation is rationalized by some scientists and government representatives as the mere consequence of the failure to follow bureaucratized bio-ethical protocols and thus a working agenda to redeem themselves, I want to argue it is a unique site for epistemic friction and negotiation of colonial and post-colonial hierarchies of difference and identity formation. In the Colombian context the contemporary transformation of group-based human diversity into a highly valued commodity ―e.g. tissue samples― articulates shifting understandings of race (associated with Afro-descendents), ethnicity (associated with indigenous groups), mestizaje (racial admixture), and of course, the nation-building process itself. Furthermore, the political reactions of ethnic minorities to genomic research are deeply informed by the multicultural turn taken in 1991 by the Colombian government on one hand, and the alignment between indigenous and international environmentalist social movements towards the governance of biological diversity, on the other. Such a conjuncture has allowed in part the presence of multifaceted forms of political and biological citizenship that overflows the traditional scope of bio-ethics and demands from geneticists a recalibration of their conceptual categories when addressing human variation. The analysis presented here draws on ethnographic and archival work at different research institutions and organizations in Colombia (Bogotá, Leticia), England (London), and the United States (Bay Area). The ethnographic study focused on three ethnic minorities' political organizations (Proceso de Comunidades Negras de Colombia, [Black Communities' Process in Colombia]; Organización Nacional Indígena de Colombia [National Indigenous Organization of Colombia]; and Organización de Pueblos Indígenas de la Amazonia Colombiana [Organization of the Indigenous Peoples of the Colombian Amazon] and on national and international geneticists doing genomic research across Colombia. In this paper I explore how both indigenous leaders and scientists narrate and experience their encounters. I elaborate on the assumptions and misunderstandings that derive from the Frazerian association and disassociation of tissue samples with individuals, ethnic groups, races, etc., and the anxieties that the question of their future governance produce in late capitalism. The analysis presented here contributes to the anthropology of genomic research and biotechnology by exploring the generation of political and economic value (bio-citizenship and bio-capital) through the governance of individual and collective genetic information. It addresses the ways in which genomic knowledge shapes, gets informed, and contested by local and transnational ways of understanding human and non-human biological diversity.

Governing Genomic Research: Indigenous Peoples and the Politics of Inclusion. *Amy Hinterberger, BIOS Centre, London School of Economics*

This paper addresses how negotiating, invoking and managing identity politics in multicultural contexts is a central aspect of governing population genomics-based projects in Canada. Specifically the paper explores new national guidelines issued by Canadian health authorities for conducting biomedical and genetic research in collaboration with First Nations, Inuit and Metis peoples. A significant aspect of the new guidelines regards the concept of "DNA on loan" in order to "promote and enable health research in keeping with Aboriginal values and traditions" (CIHR 2007). Historically, however, the recognition of the distinct status of Aboriginal peoples at national levels in Canada has led to inscribing social inferiority and biological pathology onto the bodies and communities of First Nations, Métis and Inuit people. This paper asks then, what accounts for this

distinctive shift in thinking about the governance of human genomic research where the affirmation of difference is integral to both the ethical value and scientific fulfilment of the promises of health and personalised medicine? And furthermore, what is at stake in institutionalising these forms of inclusion? The paper draws on a series of interviews conducted with Canadian genetic scientists, policy makers and bioethicists and is part of a larger research project that explores the current manifestations of Canada's multiculturalism in light of the molecularization of biology. In particular, the paper outlines the emerging politics of inclusion characterising new large-scale human genomics projects in Canada. It argues that unlike the idea that genomic science accentuates the individual as a site of governance through self-regulation and choice, genomic inclusion extends a focus to how pre-existing groups and collectivities themselves are increasingly becoming sites of ethical power and knowledge in human health genomics. The paper thus seeks to bring sustained attention towards how different nations contend with the legacy and continuing aspects of their colonial histories as a condition of their transition to postcolonial or multicultural societies where governing is increasingly becoming linked to the life sciences. More broadly the paper seeks to contribute towards developing transnational perspectives in STS focused on how science/technology and its current manifestations in biomedicine have become central to articulations of identity, citizenship and other political groupings.

Blood as a Metaphor：The Geneticization of Aboriginal Health and Identity in Taiwan. *Yu-yueh Tsai, Institute of Sociology,Academia Sicina*

Since the 1990s, to examine the particular genetic attributes of Taiwanese aboriginal people has become a more and more popular approach to research aboriginal health problem, identify aboriginal tribes, and explain the origin of the 'Taiwanese people' in order to justify a Taiwanese national identity distinct from Chinese national identity. Why is the issue of aboriginal health and identity ready to succumb to genetic discourse in Taiwan after the 1990s? How have the aboriginals been represented in genetic discourse and research? What are the historical conditions on which the development of genetic discourse and research regarding aboriginal health and identity is contingent? What is the role played by the state and the medical profession in such a development? How have they influenced the politics of aboriginal health and identity by promoting genetic discourse and research? These are the questions my paper is intended to answer. I point out that the rise and development of biomedicine based on new genetics in Taiwan has been contingent on Taiwan's particular ethnic politics, state hegemony, medical power, and globalization. Reviewing the history of biomedicine in Taiwan, I argue that the development of biomedicine since the 1990s based on genetic research has been leading to the "ethnicization of biomedicine" (the use of ethnic/racial categories in practicing medicine) and "biomedicalization of ethnicity" (the use of medical categories in characterizing ethnic/racial identity) insofar as the Taiwanese aborigines are concerned. My analysis shows how the Taiwanese aborigines have been being geneticized in the changing identity politics. It also shows that science and politics are mutually constitutive and that it is native to believe that scientists claiming to pursue pure science are any less tainted.

Chairs:

Emma Kowal, University of Melbourne

Amy Hinterberger, BIOS Centre, London School of Economics

Discussant:

Warwick Anderson, University of Sydney

207. Gender Politics

10:45 to 12:15 pm

5: 532

Participants:

Changing working roles, but no effect on the chain of command? *Kristin Hope, University of Bergen*

The gender equality question can take into consideration that different people has different experiences and prioritising, and that these differences also can be a tool to promote gender equality. Gender equality is at the same time an ideal, a goal and a norm, which makes it a complicated and challenging term to talk about and work with. It is a policy, an ideological field, and in addition a complicated narrative of the modern relationship. In centre of the narrative about gender equality is the modern autonomous human being with the power to form and construct itself. Gender equality in the Nordic countries has dealt much with rights and privileges where quantifiable measures is used to prove if the rights are being granted or not. Salary, occupation, education, positions are among these quantifiable measures that are being dealt with to see if a community is more or less gender equal. Too only look at these kinds of measures will make other values invisible. There are other dimensions that can have an effect on gender equality, but the general discourse about gender equality reinforces the measure focus. The employment rate for women is high in Norway, but we have a labour market which is quite divided where women have certain jobs. In this project we will look into a workplace where there have been a lot of changes when it comes to the content of the work. What was a secretary function is today a highly skilled administrative job that demands high education. In this project we will look into the cultural construction of meaning at a workplace where there has been quite a lot of changes in working roles and organizational changes, but not so many changes when it comes to notions about the work that is produced. Can thoughts around gender equality break open a locked position between roles and the understanding of the work that is being done? It will be important to look into the relations and experiences that are reflected, and those that are being denied and hidden. The workplace that is investigated here is a university in Norway where we have done a project with the administrative staff to look into how gender equality was being dealt with in the everyday performance of their job. We were hired to develop a guide that can be used both by the administrative staff themselves and their managers. The aim with the guide is to work out how gender equality can be taken into consideration and be integrated into the daily activity. What we have been focusing on is to map the working conditions for the administrative staff, both regarding formal and informal tasks, relationship to other occupational groups (scientific staff), autonomy and information and communication among other things. The aim with the project was to investigate the terms and conditions for the administrative staff in relationship to gender equality. In this paper we will examine how the project evolved and how the guide was developed.

Experiments in the laboratory of gender politics. *Siri Øyslebø Sørensen, NTNU*

This paper analyses the learning processes and adaptations within the Norwegian Ministry of Children and Family (MCF) in the case of introducing corporate board gender quotas in Norway. When the Norwegian Parliament, in 2003, unanimously adopted a legal reform that imposed gender quotas on corporate boards, it was on the basis of a carefully thought-out argument which emphasized profitability over traditional gender equality arguments. This argumentative strategy was prepared by the Ministry of Children and Family. A few years earlier, in 1998, the idea of introducing quota regulations to private businesses was launched from political hold, for the MCF to follow up. The measure was still unclear: What should be regarded as a reasonable quota share? Should all corporate forms and business sizes be included? The MCF had never before intervened with the management level of private businesses. Nevertheless, this became the start of an effective and targeted effort by the Ministry to facilitate the realization of the reform. The work consisted in designing the proposal and preparing the basis for political argumentation. The case was sent on public hearing twice, and was processed under changing governments. This situation required constant adjustments. In addition, opposition to reform was explored and tried countered in various ways. The analysis shows how the road towards a policy proposal was

walked up through stumbling and falling, trial and error, in the initial phases and thereafter developed into skilled navigating. The empirical data is based on in-depth interviews with administrative staff within the Ministry of Children and Family, internal records and archives of the MCF along with publicly available political documents on the case. My aim is to shed light on the corporate board quota reform as a procedural phenomenon, as well as to pursue the performative aspects of the reform work, inspired by Bruno Latour (2005, 2007). Latour, B. 2005. Reassembling the Social. Oxford: Oxford University Press. Latour, B. 2007. Turning around politics. Social Studies Of Science 37:811-820.

Women's segregation in S&T: comparing public and private sectors in EU countries. *Luísa Oliveira, CIES-ISCTE*; *Helena Carvalho, Lisbon University Institute (ISCTE-IUL)*

This paper has two main goals. The first is to analyse how European countries differ, or not, concerning a public/private science dominant pattern. The second one is to analyse if and how those patterns are related with women's employment segregation in S&T. Our hypothesis is that dominant patterns in private/public science are related with women's employment segregation in S&T, admitting that private science is even more discriminative than the public sectors. This hypothesis is supported by the theoretical principle that public institutions are more sensitive to the application of these policies and official recommendations on gender equality at work (EC, 2004 e 2007; Ruest-Archambault, 2008), given the fact that some of them have the responsibility to implement those policies and also to give examples of good practices to the society and, particularly, to the private sector. As it is known, gender discrimination in S&T is a common phenomenon all over Europe and, particularly, in High Education System (Oliveira & Carvalho, 2009; Brooks & Mackinnon, 2001; Bentley & Adamson, 2003; Cole, 1987). Considering the 27 EU as the universe, the most recent and, simultaneously, completed statistical information available in Eurostat S&T statistics was used. To identify and describe public/private S&T patterns among European countries a Principal Components Analysis for Categorical Data (CatPCA) was used. CatPCA led to the definition of patterns with a multidimensional configuration with the aim of highlighting the associations among S&T indicators and overlapping the countries into the obtained S&T structure (Geer, 1993a; Geer, 1993b; Gifi 1996; Meulman et al., 2004; Greenacre and Blasius, 2006). A Multiple Correspondence Analysis (i.e., MCA) was then applied to find women's segregation profiles. With MCA the structure and the configurations of gender segregation profiles were mapped and countries were overlapped in that structure. Finally, a Correspondence Analysis (i.e., CA) was applied to graphically show linkages specificities between S&T public/private patterns and women's employment segregation in S&T (Greenacre and Blasius, 2006; Greenacre, 2008). In the pursuit of the first goal, we analysed configurations of European countries based on indicators, namely the employment distribution of researchers across the four sectors (Government, business enterprise sector, private non profit sector and Higher Education) and S&T expenditure by country. Five patterns were identified that distinguish groups of countries from each other, revealing the existence of different situations among EU countries. One group consists of central and northern European countries. The eastern European countries belong to two different groups. One also includes Spain and Greece and another Portugal and Italy. Luxembourg/Netherlands and Bulgaria present two other different patterns, consequently defining each as a cluster. We therefore analysed gender discrimination in the four above mentioned sectors by country. Gap levels were used as input variables and we obtained a hierarchical distribution of those gap levels. This means that women employment segregation profiles are organized in a growing scale of segregation levels. Finally, we evaluated to what extent the previously identified five European private/public patterns are distinct from each other in relation to gender discrimination indicators.

Making masculinities among experimental plasma physicists. *Helena Pettersson, Umeå University*

The aim of this paper is to discuss how physics can be analyzed with perspectives from masculinity studies. Specifically I will discuss how gender is produced through acts of masculinities among experimental plasma physicists. The analysis is founded on following observations and deep interviews with plasma physicists at a laboratory in the west coast of the United States. The point of departure is my informant's definitions of laboratory work, which is a central activity and continuously defined through daily practice and narratives. In addition to experimentation and analysis, research meanings are articulated through hands-on knowledge and skills in building equipment and machines. I will problematize the need and use of a masculinity analysis in order to understand how disciplines as plasma physics are gendered. I also want to discuss how masculinity is constituted within the daily practices and discourses about physics and therefore integrated within the local culture among the plasma physicists. Even though the lab is described as a neutral space without gender biases or hierarchy, different set of necessary skills are tied to values of unspoken masculinities. In my informants' oral histories, narrated and practical skills are central stories when my informants' construct the essence of experimental physics as experimental physicists. The informants' ability to conduct research is dependent on their family situation, ability to move to other experimental sites and participate in networks of other physicists. These gendered practices affect the physicist's idea of the requirements for conducting good physics. The main body of the paper is spent on a discussion about how to interweave contemporary masculinity theory with the analysis of physics. Here, I will also discuss how perspectives from for example Connell and Hearn can be applied when analyzing such scientific environments as experimental physics. I will also discuss why I think that a masculinity perspective is specifically useful as a parallel discourse in relation to a broader gender theory perspective and to women & feminist studies. My work is situated at the trisection of gender studies, science and technology studies and cultural anthropology, where I focus on narratives on the construction of gendered research identities, knowledge representations and embodied practices in laboratories. My results can be used to further develop a feminist understanding of the relationship between gender and physics, but can also be used to develop policies concerning equality and the conditions for knowledge making cultures in the academy.

Men's networks in science and engineering, is this a place for participating power and reproduction of traditional masculinities? *Felizitas Sagebiel, University of Wuppertal, Faculty of Educational and Social Sciences*

Several projects in which the author has been participating (Womeng "Creating Cultures of success for women engineers" www.womeng.net, PROMETEA "Empowering Women Engineers in Industrial and Academic Research" www.prometa.info) focussed on women's career in engineering and their structural barriers. Qualitative data have been gathered through semi-structured interviews with women engineers. Focus group discussion was the privileged method to get known the more tacit elements (Godfroy-Genin and Sagebiel 2007). Investigated were organisations in different sectors: Industry, higher education and governmental research organizations. Even though men's networks have not been the main focus of our research at the beginning the results show the big importance of them for organisational culture. We learned from respondents about the exclusive function of men's networks for careers in practise and research. Furthermore women did not know about all the existing networks from which they were excluded. Focus groups with male engineers showed a better developed awareness and knowledge in comparison to the discussions with female engineers. Results from Womeng in which only women were asked individually and in groups (Sagebiel 2007) showed, besides others, a dominance of men's working culture (masculine culture, minority situation, coping strategies), and men's networks. Their restricted entrance to men's networks was seen

as an important career barrier by women engineers, especially in industrial management positions. Diversity programmes seemed to help to weaken the power of traditional men's networks. Results from PROMETEA (Sagebiel 2010) separated focus discussion groups with female and male engineers in research from 12 different European countries were made on basis of semi-structured guidelines. In different sectors of engineering research organisations (industrial, academic and governmental) researchers were asked about their working conditions and career opportunities. The results show in what ways networks are gendered, embedded in gendered working cultures by traditional gender division of labour, gender stereotypes and gender awareness. An actual national German research project on women at the top of environmental and technical organisations seem to confirm the central role of networks for successful acquisition of projects, nationally and globally, their success and combined career success. Sectors to be investigated are higher education, industry, governmental research and NGOs. As conclusion men's networks still exist and they seem to be more important then performance for career and successful working life in science and engineering. Men talk partly freely, partly hesitating about the rituals as well as importance of networking. Women seem to become more aware of their importance and when being excluded from them look for their own gender separated new elite networks.

Toward a "Feminista" Science Studies. *Sara P Diaz, PhD Candidate, Women Studies, University of Washington*

As part of a collective project towards the decolonization of the academy, Chela Sandoval has pointed to the study of science as a "cultural artifact" as one means of deregulating the disciplines and putting an end to what she calls the apartheid of academic knowledges (2000, p. 10). Science and technology studies is well positioned to assist in this project, but has, thus far, been separated by that apartheid from U.S. third world feminist theories. A dialog between these two fields is critical to realizing this decolonial vision and advancing, in particular, our understanding of women of color's engagement with science. If, as Foucault claims, "'Truth' is centered on the form of scientific discourse and the institutions which produce it," then the academic/scientific hierarchy, and who is included or excluded from it, is critical to the production and diffusion of "power/knowledge" (1980, p. 131). Thus, at stake in the question of women of color scientists is knowledge about how some of the most marginalized people in society gain access to one of the most privileged positions, the power to make truth through the power to make knowledge. In this paper I layout the obstacles which prevents science studies from fully contributing to the project Sandoval lays out in Methodology of the Oppressed. First, the critical and theoretical forces which shaped the field have privileged the content of science over studies which examine science from a more institutional perspective (Hess, 1997). Second, the historical construction of the "scientist" in binary opposition to racialized/gendered bodies, has made the latter something unthinkable in the Western logical/scientific imagination. In the interest of beginning to erode the distance between science studies and US third world feminist theories, I attempt to show their theoretical and methodological compatibility and advocate the establishment of what I call "feminista science studies." A feminista take on science studies would examine science through a U.S. third world feminist lens and pay careful attention to the normative and resistant roles that racialized/gendered bodies and meta/physical space play in who counts as an authoritative producer of knowledge or truth about the natural world. While Donna Haraway's work has been controversial among academic feminists of color, I suggest that the model she lays out in "A Game of Cat's Cradle," which involves a weaving together of "cultural studies; feminist, multicultural, and antiracist theory and projects; and science studies," results in a methodology which, like the children's game it is named for, allows for a kind embodied knowledge and creativity (1994, p. 62). These, I contend, are required to make the woman of color scientist "thinkable," thus avoiding the pitfalls of traditional social science, and allowing a deeper understanding of science, race, and gender as relational concepts.

208. Boundary Destruction: Global Social Movements and the Interrogation of the Scientist/Lay Boundary

10:45 to 12:15 pm

5: 533

Social movements engage with issues of technological design and development, the practices of medicine, knowledge-production, risk assessment, and the social impact of science and technology in a variety of ways. Likewise, STS scholars have analyzed social movements using a range of methods and by asking a range of different questions. This panel builds on recent work in STS that focuses on the contribution to social movements of activists across the entire scientist/layperson spectrum with special attention to the often questionable demarcation between 'scientist' and 'activist'. Using the cases of disability activism in the computer industry, anti-nuclear and health activism in the Marshall Island, the 'subversive' science of early ecology, and the global movement for tobacco control, we question the extent to which activists challenged science, whether scientists acted as activists themselves, and whether the distinction between science and activism is a useful one in each case.

Participants:

"We can't relocate the world": Activism and the use of the Scientific Uncertainty of the Bravo Medical Program. *Laura Johanna Harkewicz, University of California, San Diego*

In 1985, members of the international environmental organization Greenpeace placed the epigram noted above on a banner outside the main satellite facility of the Kwajalein Missile Range in the Marshall Islands. Greenpeace was in the process of relocating the people of Rongelap who had been exposed to radioactive fallout from the 1954 Bravo hydrogen bomb test - the largest nuclear device ever tested by the U.S. The Bravo Medical Program (BMP) was developed in response to the exposure of over 200 Marshall Islanders. The Program continued for over 40 years. The BMP had two, often conflicting goals: medical care for the exposed and research into the human biological effects of radiation exposure. By the 1970's, lingering scientific uncertainty about radiation effects, and general societal lack of trust in the objectivity of scientists affiliated with the government, provided an audience for activists who supported - some say created - Marshallese claims of human experimentation at the hands of BMP doctors. In the Marshall Islands, exposed Marshallese joined forces with other anti-colonial, anti-nuclear, and health activists who created media attention that focused on the scientific knowledge generated by the BMP. Activists stressed the need for independent (objective) scientific review of data rather than additional data collection. They argued it was not the data that was unreliable, but rather the people involved in its interpretation lacked credibility because the work was done within the national laboratory system. Activists drove publicity about the Marshall Islands, linking events - like the 1979 Three Mile Island accident, the fallout exposure of the crew of the Japanese fishing boat, The Lucky Dragon, and the experiences of atomic veterans and Nevada Test Site "downwinders" - to the nuclear histories of the Islands making them part of the international atomic history, a history that often focused on victimization, uncertainty, and fear. In this way, they attempted to create a global "radioactively-exposed" identity based on the collective experience (and potential threat) of radiation exposure. The Marshallese assumed this identity to guarantee access to medical care and compensation. Publicity served as the basis for claims to biological citizenship. Through an emphasis on articles published in the popular press, I show that activists produced a drama of the Marshallese experience to stand as an exemplar of the state's inability to adequately protect the health of its citizens. Like other literature on social movements, this paper documents how the influence of scientists was destabilized while the authority of science was confirmed. In addition, it demonstrates how

activists' engagement with science undermined Marshallese claims to biological citizenship. By stressing the conflict of interest inherent in the BMP, activists got the independent review they desired but, because the causal link between exposure and effect could never be conclusively demonstrated, Marshallese biological citizenship remained contested as did their claims for compensation. This paper, therefore, engages not only with STS literature on health movements, but also those that address problems with resolution of health and environmental policy debates and the construction of scientific certainty.

Jackie Brand and Disability Activism, within the Computer Industry and without. *Elizabeth Petrick, University of California, San Diego*

In 1988, disabillity activist and parent of a disabled child, Jackie Brand went to work for Apple Computer as a contracted employee under the Office of Special Education and Rehabilitation (OSER). While there, she helped found the National Special Education Alliance (NSEA), a nonprofit umbrella group organizing eleven smaller activist groups across the country. A couple of years later, the NSEA disengaged itself from Apple and, by early 1990, renamed itself as the Alliance for Technology Access (ATA). The ATA today comprises a network of forty non-profit groups, spread across the U.S. that serve local communities by providing training, libraries, advocacy, and consultations relating to assistive technologies. In going to work for Apple, Brand left a local, parent-run activist group, the Disabled Children's Computer Group (DCCG). She and her husband, Steve, had helped create the DCCG, in 1983, in order to find technology that would aid their disabled daughter in education and communication. At the time, they found no system in place that could help fulfill the promise of computer technology for someone like their daughter. The DCCG worked with parents and computer companies in and around Berkeley, California to disseminate information about how to acquire and use accessible computer technologies that could aid disabled children and adults in communicating. Companies, including Apple, gave technology demonstrations directly to the group, while DCCG members were invited and funded by Apple to share their expertise on special education with the OSER. By 1988, however, Brand saw an opportunity at Apple to access resources not within reach of the DCCG. She worked with Alan Brightman, the newly appointed Manager of Innovative Education at Apple and took advantage of the company's willingness to supply resources, money, visibility, and the ability to influence future technology from a direct source. Eventually though, Brand knew Apple's mission and the NSEA's were fundamentally different, and she returned to independent activism, although of a far greater scope than before. The renaming of the NSEA to the ATA fully evidenced the group's separation from Apple and better reflected their goals. I explore this history of disability and technology activism, in order to ask: in what ways did disability activist groups act as mediators between computer developers and disabled users? How did activist groups, as mediators, represent users' interests versus their own? Jackie Brand viewed working with Apple as a necessary step to accomplish the work she sought to do. She lauded their commitment to accessibility as genuine and not just a desire for publicity. By combining local efforts with industry, she saw a way to impact individuals' lives across the country. Brand's working for Apple Computer in order to improve disability activism demonstrates a lack of any strict division between activists and industry in this history. I use these unclear boundaries between activists and industry to provide a different perspective on the co-construction of disabled users and computer technology. Activists, here, exist as mediators, spokespeople, and employees of the companies developing the technology they seek to effect.

209. SSS Editorial Board Meeting

12:15 to 1:15 pm
5: 515

210. Genetic Diseases and Screening: From Lab to Clinic and Back

1:15 to 2:45 pm
12: 1212

Participants:

Biomedicalization of muscular dystrophy, stem cell and Syndrome Fragile X in Brazil: knowledge in circulation. *Neide Mayumi Osada, Unicamp (Brazil)*; *Maria Conceição da Costa, Unicamp (Brazil)*

In a post-colonialist environment, it is urge to understand the process of biomedicalization in developing countries. What are the characteristics? To whom is it going to benefit? Who are the actors and their network? How does knowledge travel? How is this knowledge transformed? The purpose of this paper is to discuss the process of biomedicalization in Brazil through the ethnography of laboratories of musclar dystrophy, Fragile X Syndrome and stem cell researches; the ethnography was carried on from April 2008 to August 2009. This study takes into account gender and science studies, post-colonialist approaches and biomedicalization studies (Clarke, 2003; 2009, Harding 2008; Petryna, 2009). The biopolitics paradigm, biopower (Epsten 2007; Thompson 2005; Foucault, 1990) and necropolitics relations (Benjamin, 2003) are also be considered to understand it. The research of biomedicalization in Brazil started in 1997 with the Fapesp Genome Project (FGP) settled between laboratories in Sao Paulo state, the main objective was to learn how to produce knowledge in Molecular Biology, using up to date technologies. The stratification of Brazilian society, gives us a more complex comprehension of biomedicalization. In this sense, for high middle and upper classes the availability of biomedicine is more or less similar to what is offered in central countries, which means that those people can afford, out of pocket, to pay for what is called modern medicine. Some of them pay for the highest quality of health insurance, others travel to get the best treatment and most of them can access services through internet (23andme, for instance). But for the average of Brazilian population, modernization comes from the border: "borders of belonging in modernity" (Clarke, 2003). The access is difficult, although some laboratories, those that belong to the university, university hospitals and model public hospitals have partially fulfilled the expectation of having modern science to understand uncompressible illness or to have more inclusive medicine (Epstein 2007), but the majorities of hospitals, especially in areas in which the budget is more tight for public health system, modernity seems to came slowly. The studies of musclar dystrophy, stem cell and Fragile X Syndrome carried by the laboratories studied compose part of the puzzle to understand biomedicalization in Brazil. They help to construct the environment in which knowledge is produced, presenting how biomedicalization travels (from north to south) through the exchange of researchers from Brazil to laboratories in Europe or EUA, internationals data bank in which scientists have access to sequenced DNA code, and international cooperation between groups of researches in the same field. Those laboratories studied offered diagnoses of certain genetic diseases using the technologies available at the lab and also genetic "advice" for couples that already had child or family history in genetic disease. In this way, following the researchers and scientists (micro level) will provide us an understanding of how knowledge is produced and how it travels, and the relation between scientists and institutions (government, funding agencies, international foundations and cooperation) give us an understanding of the meso level of biomedicine.

Emotional Labour and Natural Resources: the hidden labour of psychiatric genetics. *Andrew Bartlett, Cardiff University*

In the post-Human Genome Project (HGP) era, research into the genetics of complex disease has become a big science, involving international collaborations between many research groups. This increase in scale is driven by scientific necessity; in order to identify genetic variations of small effect, scientists require thousands of cases and controls. Research participants with the condition of interest are a finite natural resource. In big physics,

scientists aggregate around big machines. In the post-HGP life sciences, it is collections of biological samples and phenotypic data that are the axis upon which big science turns. The development of large-scale genetic studies of complex disease is often written as a history of increasingly automated high-throughput laboratories and increasing international collaboration. The labour that lays the foundations of this science - producing fridges full of plastic tubes of DNA and hard disks full of phenotypic data - is often left in the background. Accounts privilege the physical manipulation of samples in the laboratory and the cognitive labour of symbolic transformation, not the emotional labour of extracting material of scientific value from research participants. This paper draws on qualitative data gathered during research within a leading psychiatric genetics research group, including interviews with psychiatric fieldworkers and Principle Investigators, and observation of fieldworker training. The emotional labour of collecting samples and data is especially visible in psychiatric genetics, in which the collection of phenotypic data unavoidably involves the use of interviews. The work of the psychiatric fieldworker is highly skilled, involving the cognitive, symbolic labour of administering phenotypic interviews and the technical, material work of extracting blood. However, extracting scientific value from research participants is not merely a combination of the manipulation of the symbolic and the material, but also involves a degree of emotional labour. Superficially, this emotional labour is similar to that performed by healthcare workers. However, the relationship between fieldworkers and participants is fundamentally different to that between healthcare workers and patients, not least because the participants receive no material benefit as a result of taking part in the research. The fieldworker must engage with research participants, working to make programmatic interviews into sensitive topics, which the fieldworker conducts on a day-to-day basis, feel like acts of genuine interest. They must also manage the expectations of participants, and, while fieldworkers are often required by circumstance to engage sympathetically with the personal and social troubles of participants, they must do so without commitment to any position or action. This paper examines the way in which this emotional labour is performed, and considers the ways in which this labour is crystallised and incorporated into large-scale international collaborations.

Evolutionary Biology and the Implications of Genetic Screening Technologies: Analyzing the Impact of 'Working Objects'. *Jeremy J. Leveque, Queen's University*

Genetic screening procedures allow patients to gain insight into the potential genetic challenges their children might face, which is information that can influence their decisions about continuing or terminating a pregnancy. Such decisions have obvious implications for human evolutionary biology. Previous work in STS has provided greater insight into how patients negotiate complex information about genetic risk and decisions to undergo a variety of screening options. This paper focuses on explicating the origins of the knowledge that is communicated between biomedical practitioners and patients undergoing genetic screening. This information originates in the construction of 'working objects.' Working objects constitute a necessary part of scientific practice, providing a standardized referent for a particular part of nature. Here, working objects serve as a referent for the complex relations between genes, reproduction, and human evolutionary biology that are communicated to patients undergoing genetic screening. Natural objects of study are inconsistent, variable, and unique, making generalizations and comparisons difficult and the development of working objects fundamental to the practice of science. However, to the extent that a working object is an abstraction, it is also incapable of providing an accurate description of the complexities of that portion of reality it is meant to represent. Conclusions reached by patients undergoing genetic counseling are the result of expert interpretation and reliance on the working objects of genetic screening. This paper traces the path of genetic science and technology from the initial steps in the laboratory through to its ultimate outcomes in the lives of parents and their children, providing a map as to how discoveries in basic research can lead to genetic screening for fetal 'abnormalities' through the construction of standardized working objects. It addresses how patients (and in particular pregnant women) are expected to make potentially life-determining decisions based on complex scientific information that is translated to them through experts whose own understanding emerges from standardized working objects, such as the concepts and procedures used in genetic screening. Such working objects can influence patients' decisions on whether or not to continue with a pregnancy, how fetal genetic markers are interpreted, and which 'abnormalities' are regarded pathologically, and therefore act to discourage parents from continuing pregnancies. In analyzing the role of working objects in genetic screening this paper addresses several issues of concern: The role of working objects in communication between patients, physicians and/or genetic counselors; patients understanding of the science and technology of genetics; and, importantly, how researchers and practitioners of biomedicine understand and utilize the working objects of genetic screening. This paper advances STS understandings of the role of working objects in shaping genetic screening technologies and patients' decisions. Such a study is of importance to the broader STS program. The technologies and procedures used within biomedicine are, as in other sciences, ultimately dependent on the construction of standardized working objects. Understanding how these working objects interact with practitioners, technologies, and public understandings of science can provide greater insight into the role working objects play in other areas of interest to STS.

Population Screening for Emergent Conditions: The Clinic as Site of Genetic Knowledge Production. *Stefan Timmermans, University of California, Los Angeles; Mara Buchbinder, UCLA*

According to the WHO's Wilson-Junger criteria formulated in the early sixties, public health researchers should justify the decision to screen large populations for rare conditions with their understanding of the nature of a disease, the importance of a disease, the availability of treatment and testing, and the existence of defined benefits for screened individuals. Once decisions to screen populations have been made, however, the knowledge about a disease almost inevitably turns out to be incomplete and more complex than anticipated, raising the fundamental issue: what is the disease we are screening for? The answer to this question may require a revision of key knowledge aspects of a disease: including understanding of its natural history, treatment, diagnosis, and intended beneficiaries. Drawing upon observations of patient-doctor interactions in a genetics clinic, we are interested in how knowledge gaps about the nature of disease are managed in the case of newborn screening. We examine how clinicians create new knowledge about individual diseases and how this knowledge travels beyond the local setting to influence the feasibility and organization of population screening programs. We locate our topic at the intersection of medical sociology and the STS literature on biomedical knowledge production. Social scientist have noted that while much biomedical knowledge production takes place outside the clinic in laboratories or randomized clinical trials, the clinic remains a site of localized construction of medical knowledge. We contribute to this literature by examining how clinical experiences that change the understanding of diseases travel outside the clinic and reflect back on population screening programs. Because we are interested in how clinicians tinker with the epistemic and ontological understanding of individual disorders being screened, our presentation is organized by disease. We start with a discussion of hyperprolinemia, an exceedingly rare condition that, if untreated, may lead to seizure disorders and mental disorders. We examine how clinicians decide that an elevated level of proline is worrisome, how they distinguish between a milder and a serious variation of the condition, and how they impact the future detection of this condition. Next, we develop the inclusion of MCAD-SCAD

disorders, two conditions that prompted the expansion of expanded newborn screening. Here, we focus on how clinicians determine whether to pursue follow-up testing that has little clinical value for individual patients but may help them to understand the disease and how the results of such testing helps them differentiate between a milder and more serious version of the condition. Turning next to carnitine deficiencies, the clinic where we have been conducting research has been at the forefront of finding maternal rather than mother metabolic disorders. We explain how the clinicians decided to test mothers and what the implications of finding these mothers is for the understanding of the natural history of carnitine-deficiency disorders. Taken together, our examination of knowledge production in the genetics clinic shows how population-based screening poses ontological questions about the nature of screened diseases, which, in turn, reflect back on the feasibility and social organization of population-based screening.

Pre-Implantation Genetic Diagnosis in Spain: beyond the geneticization thesis. *Vincenzo Pavone, CSIC - Consejo Superior Investigaciones Cientícas*; *Flor Arias, Institute of Public Policies - CSIC*

In the past ten years, genetic testing technologies associated with reproductive practices have experienced important scientific progress and have become widely used in a number of western countries. The case of pre-implantation genetic testing, for instance, is especially remarkable: a technique that was in the experimental stage in the late Nineties is becoming a routine practice in in-vitro fertilization processes. According to the ESHRE database, in 2005 nearly 6000 PGD had been performed in Europe, which correspond to around 5 per cent of all IVF cycles conducted in that year. The diffusion of PGD, however, is not homogenous across European countries, because some of them have prohibited its use, like Italy and Germany, and others, like France, do not show significant interest in their deployment. In contrast, Spain shows a remarkably different situation: one third of all PGDs performed in Europe in 2005 were actually carried out in Spain. Whilst mainstream bioethics addresses legal and ethical implications of PGD from an abstract perspective inspired by the principles of patient choice and reproductive autonomy, sociological studies have so far focused either on the endorsement of social and genetic discrimination or on the role of PGD in the process of geneticization allegedly affecting current medical practices. Yet, considering that the diffusion of PGD shows remarkably different trends across European countries, little research has been done on the played by a variety of national (legal, cultural, economic and political) l in the actual diffusion of PGD. This study, therefore, tries to cast some light on the role that these factors played in the emergence and diffusion of PGD in Spain by taking into account the perspective of the regulators. The study combines the analysis of juridical documents, national and local regulations, with semi-structured interviews to the past and present members of the National Assisted Reproduction Committee (CNRHA), which is in charge of PGD authorization in Spain since 1998. As a result, we come to the conclusion that the remarkable diffusion of PGD in Spain is strongly associated with the contingent interaction between the growing momentum enjoyed by embryonic stem cell research, which needed a growing amount of embryos for developing stem cell lines and a vibrant expansion of IVF business along the Mediterranean coast, whose new policy aimed at offering IVF techniques to fertile couples with high maternal age or hereditary genetic mutations. Whilst it is true that the criteria for application of PGD are indeed extending PGD to polygenic, late-onset ones, geneticization per se seem to be insufficient to explain the actual unfolding of the process.

211. Disaster

1:15 to 2:45 pm

12: 1213

Participants:

Managing the Crisis: An Anatomy of the Amagasaki Derailment and the Politics of Fault-Tolerance. *Michael Fisch, University of Chicago Anthropology*

This paper will deal with the policies of fault-tolerance safety for urban technological infrastructures from an anthropological point of view. It will begin by tracing genealogy of the concept of fault tolerance safety within technological and socio-political discourses. It will then look at how the policy has been applied to commuter train operation in Tokyo and Osaka before turning to examine the outcome of a major train derailment on the JR West Fukuchiyama Line near Amagasaki in 2005, in which 107 people were killed. The central question is how the notion of fault tolerance has been problematized by the commuter community affected by the accident and how the community's response and demand for safety has reshaped the technological and human relations organized around the term. My argument will present work from my current book manuscript, which draws on my PhD dissertation and nearly three and a half years of anthropological fieldwork in Japan. The concept of fault tolerance safety generally denotes a system that can continue to operate despite an accident or malfunction of components, rather than one that works to prevent accidents entirely. It is consistent with a shift in focus from an attempt to impose an ideal model, to trying instead to manage an effective reality. Or, in more particular terms, it corresponds at a number of levels with a transition from "managed society" (kanri shakai) to a kind of biopolitical modality of "crisis management" (kiki kanri). In tracing the genealogy of the term, fault tolerance, I draw on Michel Foucault's thesis on biopower. In this thesis, Foucault points to the emergence of population governance as the management of an effective reality. This is in contrast to previous systems of governance that attempted to impose an ideal model of norms and forbid all that does not conform to that model. Managing an effective reality conforms to what we now call real time management and it exploits the science of statistics as a means for grasping current conditions and modeling future probabilities. As a safety policy, fault tolerance dictates that accidents cannot be prevented but their damage can be diminished. This was the guiding safety policy for the JR West train company at the time of the Amagasaki accident in 2005. Through interviews with victims of that accident, analyses of arguments against JR West voiced by a grass roots organization, and observations of numerous memorials for the victims, I show that the Amagasaki accident led to a contestation of the science and rationality of the notion of fault tolerance. I argue that in wake of the accident, the community of victims articulated a demand for safety based on a social premise of reciprocation that ultimately unhinged the science and inherent temporality of the notion of fault tolerance.

Minamata revisited: ecological intimacy, trophic dynamics, and overflows in an envirotechnical disaster. *Tyson Vaughan, Cornell University*

The general outlines of this story are well known: in the 1950's a chemical plant in Minamata, Japan, poisoned an ecosystem, and killed or injured thousands of people, by pouring tons of untreated, mercury-laden effluent into the local bay. This paper, however, begins with the proposition that "well known" does not necessarily equate to "well understood." Although excellent work has been done to elucidate the events in question, such as Harvard scholar Timothy George's masterful Minamata: Pollution and the Struggle for Democracy in Postwar Japan (Harvard East Asia monographs: 2001), hardly any of this work has engaged with two fields that presumably would have much of value to contribute to an understanding of the tragedy at Minamata: environmental history (EH) and science and technology studies (STS). This paper posits that a reconsideration of Minamata's history, informed by these two fields, promises to enrich — if not reconfigure — our understanding of the disaster, not simply as a unique event, but as an instance of envirotechnical catastrophe more generally. Simultaneously, the paper points to Minamata as a case uniquely suited to "stress-testing" theoretical sticking points such as methodological relativism, the "symmetry postulate" of the sociology of scientific knowledge, and related tensions between

EH and STS. The paper's aim is neither to present an exhaustive analysis nor definitive solutions, but rather to gesture toward productive theoretical questions and possibilities for reinterpretations of historical narrative, while offering a fresh look at a particularly important historical (and ongoing) case. The paper recapitulates the rather dramatic story of the Minamata disaster, drawing from multiple secondary accounts, including those of George, Eugene Smith, Harada Masazumi, Ui Jun, and others. It then presents a reinterpretation of this synthetic narrative, in which trophic dynamics, "ecological intimacy," and a cascade of unforeseen boundary overflows — chemical, ecological, and social — are offered as central organizing principles for understanding the plural and diverse experiences of the disaster. Finally, the paper explicitly discusses the theoretical difficulties with which scholars of science, technology and the environment must grapple in addressing cases like Minamata, in which sympathies so quickly become lopsided and "the science" as well as the politics and ethics appear to be so clear-cut. What does "symmetry" in such cases entail? To what extent should scholars attempt a "symmetrical" account? These are just a few of the questions that this paper begins to explore. Minamata, and similar cases, deserve closer scrutiny from scholars of science, technology and the environment.

Some problems on studies of Kanemi Yusho disaster. *Mamoru Shimoda, Shimonoseki City University*

Kanemi Yusho disaster, a large-scale food poisoning incident caused by PCBs and dioxins in western Japan, began to be known in October 1968. Since then more than 1900 patients have been officially certified, and among them more than 500 have died. Victims of this disease suffer not only from various symptoms and diseases but also from economic and social hardships in life and work, as well as various forms of discrimination. Moreover, it is said that thousands or more people who took the toxic oil but have not been officially certified have almost the same conditions as certified patients. This presentation intends to outline how science and scientists in various fields appeared or remained absent in studying Kanemi Yusho, and to pick up some problems behind the situation. Kanemi Yusho has some relation with many academic fields such as medical scienses, law, agriculture, engineering, chemistry, food science, sociology etc., but none or only few researches have been conducted about Yusho in most fields except for medical sciences and law. Moreover the resarches on Yusho in medical sciences and law were also inadequate. Since October 1968 the Study Group for Yusho was organized by the authorities, and researches have continuously been conducted by the group mainly in the field of medical science. But the medical researches have not succeded in finding effective treatments for the disease,and the commonly accepted views on Yusho estabiehd by the group have underestimated the reality of the Yusho disaster. Most of the papers on Yusho treat the judgements and were published before 1986, but the settlement in the Supreme Court in 1987 were not analyzed. Yusho is the first case in history of a large-scale food pollution disease caused by a then unknown chemical poison which might affect through generations. Many problems, both medical and social, still remain today, partly because thorough investigations into both the contamination and human damage were never done, as well as the researches on Yusho in various fields were inadequate or not conducted. The problem is to some extent in common with similar large-scale disaster such as Minamara Disease etc., and it would reveal some kind of structural problem of the (academic) society in Japan.

A new equation: The Andaman & Nicobar Islands after the 'tsunami' of December 2004. *Pankaj Sekhsaria, Maastricht University*

Why is December 26, 2004 lodged in public memory as the day the tsunami hit and not for the earthquake that was responsible for it? Were the tsunami and earthquake, together, a natural event or a natural disaster? What is the difference between the two? When does an event become a disaster? Is it possible that it was an event in some contexts and a disaster in another? This paper explores these questions by looking closely at the Andaman & Nicobar Islands, a small group of relatively little known islands in the Bay of Bengal. Though part of Indian territory, the island chain is located much closer to Indonesia and situated very close to the epicenter of the earthquake of December 2004. Not surprisingly the tsunami that hit coasts across South and South East Asia also had a huge impact in these islands: over 3,500 were killed and property worth millions of dollars was washed away. While the waves of the tsunami were the direct cause of the death and destruction, it was the earthquake that played a more crucial but little understood role in these islands. It caused a significant and permanent shift in the lay of the islands. The southern Nicobar group of islands saw permanent subsidence of about 15 feet while the northern Andaman Islands saw a lift of upto five feet. Anecdotal accounts indicate that this subsidence occurred well before the tsunami hit. It was this combination of subsidence followed by the waves that caused much larger damage in the Nicobars even though the area and population here is much less than that in the Andamans. Also contrary to expectations and popular belief, the indigenous communities of these islands showed no special fore-knowledge of the earthquake or an impending tsunami. This, inspite of the fact that their knowledge of the marine resources is both extensively and intricate; that the region regularly experiences earthquakes; and has also been hit by tsunamis within the last two centuries. Another little studied aspect has been the huge changes effected to the topography of the islands and the coastal and marine ecosystems. An intriguing set of subsequent and successive changes in the disturbed ecosystems have also started to occur; providing interesting insights into ecological changes that occur in response to dramatic geological events. This paper is a detailed account of the impact and changes in the islands due to the earthquake and the tsunami. It is based on extensive field work in the islands from 2005 to 2007, media reporting of the 'disaster' and published research on various related aspects- geological, ecological, social and developmental. It seeks to find out the lessons learnt in the islands and argues that the ecological and geological changes, as also increased seismic activity here are important determinants that need to be kept in mind now for future policy and development planning.

Negotiating Neutrality in Engineering Controversy. *Wesley Shrum, Louisiana State University*

This essay argues for a renewed commitment to the value of neutrality in scholarly research, where neutrality is understood as the accomplishment of non-alignment in shifting research contexts. This ethnographic study of the role of engineering in Hurricane Katrina provides an overview of two pivotal events in the public analysis of the disaster: the sheet pile pull at the 17th Street Canal and litigation in federal district court over environmental damage caused by the Mississippi River Gulf Outlet. After Hurricane Katrina, three teams of engineers and scientists were formed to investigate the flooding of New Orleans. The author's inclusion in engineering events after the storm was facilitated through membership on a team, but continued access required his resignation. This form of non-alignment became a struggle during the following years, in which litigation drove forensic engineering and neutrality, in the wider sense, required re-alignment during the course of the trial. My conclusion is that this negotiated form of neutrality is necessary for an understanding of engineering processes. My observational inference is that both engineers and attorneys succeeded far better than STS in contributing their collective efforts to understanding the disaster.

212. Biomedical Citizenship, Consumerism, and Governance

1:15 to 2:45 pm
12: 1214

Participants:

Convergence of Personal Genomics and Web 2.0 from STS and design perspective. *Denisa Kera, National University of*

Singapore

The popularity of personal genomics on the side of the public and the importance of epigenomics to the scientific community create an ideal setting for the emergence of a new generation of social networking services that use DNA profiling and biodata. Eugenic style dating over SNPs profiles with www.genepartner.com, large matriarchal families created by sharing information on donor sperms with www.donorsiblingregistry.com, genealogical "tribes" and biotech enthusiasts discussing their DNA makup on www.23andme.com represent this trend. Social networking websites are starting to use not only socially and culturally constructed profiles created by the users but also biological profiles produced in the science labs (SNPs). Does this design objectify human subjects into biopolitical animals envisioned by Michel Foucault or it creates hybrid quasi-subjects that are the ideal citizens of Bruno Latour's cosmopolitics? What are the consequences of creating communities and relationships build around the molecular level of our identity? How will personal genomics and availability of DNA data over different on line services change our understanding of design and human subjects? This troubled relation between politics and biology is intimately linked to modernity and it is usually conceptualized as an issue of blurring the differences between the social and biological understanding of human beings, between the dignity of human condition and the science of human conditioning, between issues of collective and individual existence, polis and oikos. What is the state of this discussion in case of personal genomics and future interfaces?

Global and Local Images of Biomedical Research; a Review of Benefits. *Erik Aarden, Department of Technology and Society Studies, Maastricht University*

While science has always been unfolding in transnational networks and collaborations, cross-border standardisation and exchange of data is considered to be increasingly important in contemporary biomedical research. Especially large scale research in the area of genomics, which requires large sets of tissue and data for the identification of predispositions for 'common' diseases, is exceedingly conceived and established at a global scale. Despite the global conception of research in genomics, research projects have a strongly local character. On the one hand, the alleged importance of large scale collections of materials in genomics has led to numerous local, often national, initiatives. Examples of these include the UK and Icelandic biobanks. An important rationale behind these national projects is that investments in biomedical research are expected to bring great scientific and economic value at the national level. While global biomedical research is thus stimulated at the local level, particular local regulatory and organisational features may pose a significant challenge for cross-national standardisation and use of tissue and data. Another sense in which large scale tissue and data collections are strongly local is in the recruitment and processing of samples. In order to have material to work with, it is necessary to find donors to contribute to a collection. This is necessarily done locally - and sometimes, indeed, presented nationally as a moral obligation. For research in genomics this locality matters, since people in different places differ genetically and because the focal points of research are often claimed to be adjusted to local health care needs. Thus, in recruitment of donors and processing material in research there is another tension between the global and the local in biomedical research. In preparation for a research project looking into these issues, I will present a review of literature on biobanks (as large scale collections of tissue and data) across the globe. In my presentation I will address three different issues in how these biobanks are set up; first, how national projects relate to the requirement of international standardisation and exchange of data; second, how these projects are conceived as nationally useful for science or the economy; and third, how biobanks relate to local health care needs. I will use these issues to explore the question how large scale projects in biomedical research are imagined to produce benefits, and for whom.

Globalization in an Age of Biomedical Consumerism. *Priya Venkatesan, Santa Clara University*

The new genetics has transformed biomedicine dramatically in the past few decades. Direct-to-consumer genetic testing, personalized medicine and individualized health decision-making frequently confront patients, transforming them from passive patients to active consumers. In their ethnography of pre-implantation genetic diagnosis (PGD), Franklin and Roberts demonstrate that patients are taking a more active role in dealing with the uncertainties of PGD (2006). Personal health information management (PHIM) refers to activities that support consumers' access, integration, organization, and use of their personal health information. Civan et al, investigate PHIM in the health consumer population using a focus group and participatory design (Civan et al., 2006). Magnus et al, discuss the increasing availability of personalized genomic tests that consumers can order directly. Although these tests could provide value to customers by offering tools for social networking or genealogy, there are questions about whether and how to regulate these tests and about the extent to which they provide medical information (Magnus et al., 2009). In this age of biomedical consumerism, what is the role of globalization? First, today's empowered public is less willing to accept the self-proclaimed autonomy of science and increasingly demands evidence of its legitimacy and accountability. Second, the growing complexity of society and its problems, because of advancing trends of globalization and scientification, requires new methods of knowledge production (Caron-Flinterman et al., 2007). Current methods of assessing biomedical technologies center too narrowly on efficacy, safety, and costs. Neglect of the social, ethical, and political dimensions is untenable, given what is known about the nature of technology. On the one hand, social scientific research has shown that health technologies have a variety of sociopolitical implications for individuals and society, and therefore cannot be considered axiologically equal—some seen simply as more effective or affordable. On the other hand, the growing claims made by and on behalf of consumer groups should persuade evaluators to recognize that public policy needs to be informed by the multiple "rationalities" and values that prevail in a given society (Lehoux and Blume 2006). However, sociological research has limited its analysis of biomedical sciences and technologies to the individual level while social actors are analyzed at the local rather than the global level. However, a retreat from the global reach of biomedical technologies and its effect on global economies is no longer feasible. This paper addresses the following questions: 1.How can we define biomedical consumerism on a global level in terms of actors involved in individual decision-making processes? 2.How can state co-optation of the new genetics obviate the spectre of eugenics? 3. How can biomedical consumerism lead to a more equitable distribution of resources? 4. How can new methods of knowledge production, vis-à-vis STS studies, confront the challenges of globalization in an age of biomedical consumerism? By asking these questions, the effects of globalization on biomedical consumerism and the role of biomedical science and technology in global contexts are addressed.

213. Ethnographic Studies of STS

1:15 to 2:45 pm

12: 1222

Participants:

Making middlework public: Mods, mess and homebrew hightech innovation in suburban Australia. *Katrina Jungickel, Goldsmiths College*

Innovation practices have long been studied in laboratories, offices, hospitals and industrial settings and although tinkering, materials and mistakes are viewed as integral to the construction of knowledge they are largely hidden from view (Henderson 1999; Latour 1999; Mol 2002). However, an interest in more public encounters with messy objects and methods along with a

desire to resist the flattening of active processes is gaining purchase in ethnographic studies of science and technology (Law 2004; Latour and Yaneva 2008; Marres 2009; Yaneva 2009). In this paper I focus on how members of the largest community WiFi network in Australia make their work-in-progress, or middlework, publicly visible and the consequences this has on how they innovate, recruit new members and expand their wireless coverage. Focusing on 'mods' - innovative and resourceful modifications that emerge when things do not quite fit as a result of changing or unexpected conditions - I show how rather than filtering, tidying up or trying to flatten these interruptions, members purposely preserve, collectively share and deliberately build them into their communication network. This means encounters with trees, thieves, birds, possums, neighbours, the weather, technical complications and a myriad of material configurations are implicated in their daily engagement with WiFi. Taking up Latour and Yaneva's (2008) idea of a gull-in-flight view of a building as well as Law's (2004) encounters with messy methods in ethnographic analysis, I explore what making middlework public offers an understanding of technological practices and also how these learnings might inform the way research practitioners work with and represent their own mods and mess.

Cocoa programmers and the history of object-oriented programming languages. *Hansen Hsu, Cornell University*

This presentation is a dissertation proposal. Part of the project will involve an ethnographic study of Apple programmers on Mac OS X, as well as Apple's mobile devices (iPhone, iPod Touch, and iPad.) This is a subculture of programmers who specialize in Apple's object-oriented "Cocoa" technology, the descendant of technology acquired from Steve Jobs' NeXTStep operating system. Preliminary studies of Cocoa developers who were there at the beginning of the iPhone developer "gold rush" in 2008 suggest that this subculture is very ideologically driven, sees its members as artists and colleagues rather than competitors, and generally subscribe to an ethic of excellence in software interface design. These practitioners also believe that Apple's Cocoa technology is a revolutionary secret, and hope to evangelize its merits to the programming world at large. For these programmers, the iPhone gold rush represented both danger and opportunity-opportunity to spread their technological paradigm, but danger that their community and its values might disappear in the face of newcomers from other platforms who might value economic considerations over product quality. The other half of the project hopes to trace the history of the technology espoused by this subculture, "Object-Oriented Programming." Secondary research has suggested that, in contrast to the theses of historians Nathan Ensmenger and the late Michael Mahoney, object-oriented programming was not invented by managers as a technology to discipline software workers in the midst of the "Software Crisis" of the 1960s. Rather, it was created in academic environments. Although Simula was the first language to pioneer object-oriented concepts, the full features of object-orientated languages (agreed upon by current academic computer scientists) came together first in Alan Kay's Smalltalk at Xerox PARC. Alan Kay's project was in part academic research, and he was influenced by LISP, developed at Stanford, and by Seymour Papert's Logo, a language designed for education. Kay was surrounded by countercultural influences, and many of his colleagues at PARC had been associated with Doug Engelbart's human augmentation project at Stanford. Smalltalk, then, was a technological embodiment of values central to the personal computing movement, drawing both from the counterculture, cybernetic ideas of human-machine symbiosis going back to Vannevar Bush's memex, and represented a new way to organize human thought, making mental categories and their relationships the fundamental building blocks for software. This technology and the values embedded in it were later taken up by Brad Cox's Objective-C language and Jobs' NeXT. Cox, connecting his version of the technology to a libertarian agenda, hoped that it would bring about a software "industrial revolution" and create a market for self-contained software components that developers could buy "off the shelf." Although this vision never came to pass, proponents of Apple's Cocoa still hope that the advantages of dynamic object-orientation will spread to the rest of the industry and release new fountains of productivity, innovation, and creativity in software. This study aims to be a contribution to the STS literature on computing cultures, user and designer studies, as well as the history of software.

Accounts and Accountabilia: Tracing Paths through Patent Regimes. *Chris Sugden, University of Oxford*

Based on an ethnography of the various organs of a national patent system, this paper critically engages with theoretizations of accountability in order to offer an account of the multiple enactments of the problem of novelty within these different contexts, together with the technologies of accounting (for, among other things, the accounts of technologies) deployed in making the problem coherent and practically solvable. This problem - whether or not an invention differs, and differs sufficiently, from earlier inventions - is a foundational concern for members of the various organizations visited by a patent on its career through the patent system, and the resolution of this problem - in the drafting of the patent application, its examination in the patent office and, often, its formal analysis in the courts - is tied up with the ways in which the document and its actors are held to account.

Ethnographic Study of International Space Station: Artifacts, Institutions and Practices in its Production and Exhibition. *Akiko Kanaya Mikouchi, Columbia University*

Living in space, once a topic of science fiction is now reality as the International Space Station (ISS) has been inhabited since 2000. The Japanese Aerospace Exploration Agency (JAXA) is in charge of producing the Japanese Experiment Module named Kibo, meaning, "hope," of which the first module was launched and added in 2008 and is still assembled in space. The general public as well as mass media tends to ask astronauts about their daily life in orbit, for example eating and toileting in zero gravity rather than how science and technology make living in orbit possible. This reveals that the general public recognizes astronauts to be in the foreground as the mighty force of space exploration, because only they have experienced going beyond the earth's limits. On the other hand, those who made the spacecrafts are perceived to be in the background as they have no experience going beyond the earth's boundaries. In such a context, what do we understand about the relationship between science, technology and society? This paper deals with the cultural construction of ISS based on ethnographic data collected at the Kibo production sites together with exhibitions in and outside of JAXA. Through participant observation, borrowing some techniques from research in ethnomethodology, open-ended interview, and visitor research at exhibitions, I demonstrate that the Kibo production on the earth, in fact, involves two types of productions: building of a physical module, Kibo, and also constructing the concept of an imaginary outer space where the actual Kibo would finally operate. Various kinds of professionals are involved in a number of ways in the space project. All these members locally create their own views of space with suitable artifacts depending on what aspect of space they are dealing with. This paper will focus on two events: one is testing Kibo on the ground by simulating space environment and the other is creating and interacting with models including exhibit mock-ups which were customized to be suitable for their situations. With a close analysis of practices in producing and exhibiting modules in various sites, this research explores the dialogical process in constructing concepts of space which goes beyond the boundaries between the inside and the outside dichotomy in terms of the construction of sciences. People are categorized into those in the foreground and those in the background concerning cultural construction of ISS as well as space where the actual ISS is able to operate. In order to understand the activities of the construction of outer space more precisely B. Latour's idea of "action at a distance" would be relevant. In the Kibo project, it could be said that creating and interacting models by simulating

the orbital environment is in fact "action at a distance". This paper also takes the institutional context into account within which practices take place since the same scientific project carried out by structurally different organizations (JAXA and NASA or exhibits in several places) reveals various patterns of sciences as practice.

214. Techonological Diffusion

1:15 to 2:45 pm

12: 1232

Participants:

The Diffusion of Technological Artifact and The Diffusion of Oblivion. *Kojiro Honda, Doshisha University*

Technological artifacts could be characterized as black box into which is stuffed know-how of controlling physical and chemical phenomena. It is only necessary for us to know the inputs and the outputs to use this black-box. For instance, we don't need to bother about electronics or information theory for using personal computer, or about thermodynamics or engine mechanism for driving a car. Because the accumulated knowledge and the mechanism are opacified by encapsulation, consumers begin to skip them. It is sufficient for them only to know the function of the box. In his philosophical analysis of measuring instruments, Baird makes the point that scientific instruments have "Thing Knowledge" built-in. By looking back on the history of modern science which has been developed on the basis of instrumental development, we can understand that modern science is not only the stock of theoretical knowledge for representation of nature, but also the stock of method and skill for controlling nature. The scientific instruments convert the historical thickness of modern science into tangible form. Should the Baird's argumentation of thing knowledge be confined to the realm of scientific instruments? As Bernal mentioned about TV, scientific instruments devised for purely scientific measurement would be diverted to scientific tools with frequency. There is no essential difference as thing knowledge between scientific instruments and scientific tools. Hence the concept of thing knowledge could be applied to technological artifacts circulating in our society. Stated differently, we could consider that most of technological artifacts have built-in their own historical accumulation of theoretical and practical knowledge as the shape of thing knowledge. We return to the black-box of hi-tech artifacts. Can we open the black-box easily? No. Technological artifact pills up a lot of thing knowledge in it. It is almost impossible for a general consumer to know all of the historical accumulation of skills and knowledge for controlling the natural phenomena physically or chemically. To open the black-box, it is necessary to receive long-term instruction. But it is too difficult for one person to know any and all of skills and knowledge which support contemporary technological society. One could only be an expert of narrow confine. We live in the era of division of labor both productively and intellectually. If so, how do we utilize others' knowledge and skills? It is easy. All we need to do is to buy them. In our consuming society, we can utilize the advantageous effects or the fruits of others' knowledge and skills by buying thing knowledge built in technological artifacts. Here we can start to think about responsibility concerning the knowledge. We can relish the advantage of scientific knowledge without understanding it. Then it is possible to say that the industrial society has disseminated not only the fruit of technological progress, but also the oblivion of technological knowledge. What can we extract from this point? In this presentation, the engineering ethics and the consumer's ethics will be discussed in connection with market system and diffusion of knowledge (or oblivion).

The Development and Diffusion of an Emerging Technology: the Co-evolution of the Next Generation Mobile Communication Technology and the Services in South Korea. *Jee Hyun Suh, University of Edinburgh*

The development of a next generation mobile communication technology, WiBro (Wireless Broadband) in South Korea currently carries two sided notion with regard to its role as technology and as services. As a technological enabler of anticipated services in the future WiBro entails expectations from interested parties, yet to varying degrees: from being strongly affirmative to being rather suspicious yet mindful towards what are anticipated. Such expectations have nonetheless been the driver for technological advancement. As services being currently available, however, WiBro faces challenges from various aspects that are mingled with social, economic and political concerns and structures, which give rise to disputes among the interested parties and the stakeholders with regard to its implementation. It has been over 3 years since WiBro service was first launched in Korea. The services have been lagging in terms of market adoption, while the technology itself has been advancing towards the next generation mobile services - so called 4G. Uncertainty is rising with regard to whether the services would eventually take off, which in turn renders the network providers be reticent about further investments. The government whose leadership for many years has yielded several achievements in technological innovation also needs to take careful consideration on the future direction of the technology along with the policymaking. Diagnosing and making decisions upon such seemingly uneven progress of technological innovation and services uptake calls for a better and in-depth understanding of the relationship between the two processes. Based on the perspective of social shaping of technologies, this paper observes the process of the development and the diffusion of WiBro, especially focusing upon how the technology is appropriated into services and how the technology and the services co-evolve. The paper is based on a qualitative case study of which the sources of the data are documents and interviews. Such empirical approach towards the appropriation and the integration of WiBro technology into the services is expected to provide further insight for understanding the relationship between the development and the diffusion of an emerging mobile communication technology.

Opening the Black-Box to Unveil International Relations: United States and the Politics of Satellite Launch Vehicle Technology Transfer to Japan. *Ashok Maharaj, Georgia Institute of Technology*

Nuclear and space technologies are prestigious endeavors. The pursuit of them by a nation-state gives them domestic and international prestige and successful execution of projects becomes a litmus test for their level of scientific and technological advancement. Scientists like Hideo Itokawa in Japan; Vikram Sarabhai and Homi Bhabha in India aspired to exhibit their prowess to overcome their immediate (in the case of Japan, the defeat in WWII) and lingering past (overcoming the centuries of colonialism under the British Raj). As Japan was prevented from pursuing nuclear weapons technology through Article - 9 of the constitution, the Japanese elites saw building a space program as a prestigious alternative. The quick road toward building a launch vehicle capable of placing satellites in orbit was by developing rockets based on solid propellants. Rockets using solid fuel stages are technologically not so formidable when compared to complex and time consuming liquid fuels. While one group, led by Hideo Itokawa, was determined to gain prestige by launching indigenous satellites on homegrown rockets, another group under the supervision of Kankuro Kaneshige aspired for utility satellites that could be of benefit to Japan's socio-economic growth. The Kaneshige group was even willing to give up the task of building rockets and to focus more on "what went up." Seeing the pace of Itokawa's efforts in mastering solid fuel, which could be used for a ballistic missile, the United States was seeking an opportune moment to intervene. They didn't have to wait long, though. China tested its first nuclear bomb in 1964 unleashing a prestige vacuum in the surrounding Asian nations. The United States rushed to fill the vacuum by wooing the scientific elite in Japan for scientific and technological projects that could salvage some prestige after the Chinese Communist's achievement. Negotiations with Japan for a prestigious alternative slowly ended up in the 1969 agreement

that led to the technology transfer of satellite launch vehicle technology from private U.S. firms. The transferred technology was instrumental in the development of the N series of rockets in Japan. However, increased reliance on U.S. technology transfer during the seventies slowed down the indigenous research program on key systems because quicker alternatives were available through partial technology transfer and off the shelf purchases from U.S. and Europe in the form of "black boxes." Buffeted by the politics of technology transfer and the impeding forces that were in operation through NASA, sincere efforts toward an indigenous rocket program only began in 1977 and achieved maturity only in the 1990s when U.S. and Europe have stabilized as dominant international players in the launch industry. Using theoretical underpinnings form STS and extensive archival research this paper investigates an artifact (Satellite Launch Vehicle) to understand international relations (IR) during global Cold War. Unpacking technologies to reveal politics have been in vogue since the beginning of STS as a discipline (Langdon Winner, Gabrielle Hecht, Bruno Latour and others); taking a step further, can technology studies help us to study and understand international relations?

215. Numbers, Standardisation and Governance

1:15 to 2:45 pm

13: 1312

Participants:

Trust in numbers in the climate arena - the 2 degrees target as a "black-box". *Stefan Cihan Aykut, EHESS, Paris*

When presidents and prime ministers signed the Copenhagen Accord in December 2009, they agreed to keep temperature increase below 2 degrees Celsius. It's the first time the target is officially recognized in the UNFCCC process, but it has been influential in climate policy since the mid-1990s, and was adopted only recently by the G8 and Major Economies Forum in L'Aquila. Nevertheless, the history of the 2 degrees threshold has not yet been analyzed in detail. The present paper make a first step in this direction, and present some insights into the history of its construction. It draws on extensive review of expert reports and on semi-directive interviews with key actors of climate policy and expertise. Previous STS authors have focussed on the science-policy nexus in the global climate change arena. Edwards' (2001) stressed the "world-building" function of general circulation models, illustrating the impossibility of considering climate science and climate politics as two distinct, independent domains. Drawing on Star and Griesemer's (1989) notion of "boundary objects", other authors showed how collaboration functions despite extremely diverse scientific practices, and how scientific and political framings of the climate issue are co-produced and stabilize each other (Shackley, Wynne 1998). The first mention of 2 degrees in the climate arena is in the second assessment report of the IPCC, where the two degrees represent the "best estimate" of climate sensitivity until 2100 . One year after the report, the European Union made it an official target for its climate-policy. This political move can only be understood in the political and scientific circumstances in Europe before the Kyoto negotiations, with the abandon of the European carbon tax project and the development of new concepts in climate expertise, including the "tolerable windows approach" of the German expert committee WBGU. Since then, the target has been solidified on the scientific side (the fourth assessment report shows implicitly that 2 degrees warming is a dangerous threshold), and in the political arena. Nevertheless, its interpretation changed: at the time of its first adoption in 1996, it was associated with a concentration target of 550ppm, whilst the last assessment report indicates that we need to stabilize emissions at 450ppm or lower to have a fair chance to keep warming at two degrees! It is crucial for STS to understand how and why the target was maintained despite these dramatic reinterpretations. By using the notion of "black-box" (Latour 1999), we want to draw attention not on cooperation between distinct "social worlds", but on the fact that the seemingly simple temperature threshold is in fact the result of a complex co-production by scientific and political actors. We follow its construction and stabilization, show how it got appropriated by different actors, and ended up structuring parts of the political and scientific discourses.

Producing the Image of State: Standardization and Transparency in Public Administration. *Jon Hovland, Norwegian ministry of administration and reform*

How are standardization and positioning of devices creating different power-relations in administrations? To use numbers, is to employ power, and the use of numbers in organizations is taking sides in dilemmas relating to standardization, quantification, modeling, and accountable communication. This is why it is difficult to criticize the use of numbers on a systematic level, but it is possible when related to one of the dilemmas these four categories represent. In this study of three Norwegian city administrations, I find that the standardization of information and communication is made sense of through the positioning of devices: Who sees through the calculations, who are standardized, and where is the information sent, accepted or negotiated? These are cues to understand the differing meanings of standards in different administrations. The same standard may create both transparency and domination. I build on theories of primarily Latour and show how this kind of knowledge can be used to understand power in public, municipal administration.

Numbers or Narratives? Uses of Science in Policy-making. *Knut H. Sørensen, Norwegian University of Science and Technology*

It seems a widespread experience that policy-makers prefer quantitative over qualitative information, maybe due to a belief in a greater social authority of numbers. However, this preference is no guarantee that quantitative information actually is used in policy-making. To what extent are numbers translated into policy? In this paper, I discuss four examples that may throw some light on the issue. The first is a study of the Norwegian Parliament's decision with respect to subsidies of heat pumps. Here, the Parliament made a decision that was exactly the opposite of what was suggested through a quantitative economic evaluation, based on a moral appreciation of energy use in households. The second is an analysis of how policy-makers in the area of IT and education accounted for the information underlying their policy-making. While they state a preference for quantitative information, their accounts show that most of them primarily draw on personal experience and anecdotal information when assessing alternative paths of action. The third is a study of how quantitatively oriented Norwegian Life Cycle Analysis scientists account for their (lack of) interaction with policy-makers. They criticize policy-makers for not using their allegedly important research in the making of environmental knowledge, blaming them for lack of interest and competence. The fourth is an analysis of how policy-makers use climate science amalgamated with policy science perceptions of the climate issues. The four examples suggest, first, that moral appreciations often provide more powerful arguments than abstract numbers. Second, that numbers may be more difficult to make sense of than often is understood, that numbers may be difficult to translate into policy. Third, scientists may overrate the applicability of numbers and offer too little assistance in making sense of quantitative information.

Ordering animal farming practices: farmers vs. animal scientists. *John Brian Lever, Cardiff Univeristy*; *Mara Miele, Cardiff University*

In this paper we address the attempt to develop a common European standard for animal welfare. We examine this process as an intervention to simply the plethora of claims now made about farm animal welfare through labels and brands that order farming practices in particular ways by defining new goals, values, and competences through diverse forms of organisation. The paper is based on recent research from Welfare Quality® (www.welfarequality.net), an EU funded project that set out to accommodate societal concerns and market demands, develop reliable on-farm monitoring systems, product information

systems, and practical species-specific strategies to improve farm animal welfare. The paper presents evidence from one aspect of the project, the welfare monitor of broiler chickens, which was evaluated through a series of interviews with free range chicken farmers in the United Kingdom. The paper does three things. It explores how farmers define what they do to improve the welfare of chickens; what they do to assess what they do; and what they think of the of the Welfare Quality assessment. In so doing it highlights the competing knowledge claims of farmers and animal scientists and draws out some implications for: 1) our understandings of free range farming, and: 2) controversies between different forms of expertise. From an STS perspective, we address the question of how much flexibility and attention to specific conditions can be built into a common animal welfare standard in order to make it a fluid technology that can work in different locations to address the diversity and multiple definitions of farm animal welfare now evident in the European farming industry.

216. Medical Practices

1:15 to 2:45 pm

13: 1321

tba

Participants:

Politics of work embedded in the design of formal representations. *Yasuko Kawatoko, Daito Bunka University*

The politics of the Care Insurance Law affects Japanese old people's life severely. The law is called 'the long-term care insurance law' that was put into operation in 2000. At the time, Japanese social welfare system was changed into the social insurance system. The leading technology of this system is the institutionalized certification of the need for nursing care services. The technology of this certification was originally developed by the research group consisted of welfare experts, scholars and statisticians. The aim of the research group was to quantify both elderly' physical and mental conditions and helpers' care actions, and then to standardize them. They made formal representations on each level of nursing care requirements and its reference time, based on "one minute time-study data" recorded in nursing homes for the elderly. Thus, the six social groups of the elderly which are classified from requires assistance to requires care category 1-5 have been constituted in Japan since then. What has happened by the introduction of "time-study" methods in the elderly nursing care field? It has made elderly' actual conditions and consequently their actual needs for care services invisible. If you go behind it, this invisibility makes it possible to change numerical values of the each level of nursing care requirements and its reference time in the direction of increasing the "low level of required nursing care" to meet the Government policy of cutting down the elderly care expenses. There is a cascade of formal inscriptions produced and reproduced on the paths from an application for the certification of the need for nursing care services to the use of care services by the elderly, being represented by some different local parties. In this paper I describe the work of a certified investigator who visits the elderly to examine the certification of the need for nursing care services, and the work of a care-manager who makes care plans and manages the use of care services for the elderly. I analyze the written discourses, the interviews, and the inscriptions that the certified investigators and the care-managers produce. The aim of this paper is to explore what is involved in creating formal representations through the analysis of the design and the usage of various inscriptions. It is revealed that the characteristic of the design of work over the Care Insurance Law resides in the control and the decentralization embedded in the formal representations. The control is embedded in the standardization of the processes of producing and using formal representations. The works over this system is constituted of the cascade of systematically consistent representations. This means by the dispersion of making decisions. The dispersion of the subjects who make decisions conceals where the responsibility lies. I discuss about the politics of the design of the work around the practice of the Care Insurance Law through the analysis of current elderly care practice.

The Risk of Safety Technology - Unintended Effects of Error Reporting in Danish Health Care. *Kirstine Zinck Pedersen, Copenhagen Business School, Institute of Organization*

A number of authors have argued that audit- and self monitoring technologies introduced to reduce errors or risks are likely to create new kinds of risk (Perrow 1984, Power 2007, Strathern 2000). However, few have studied the nature of these risks and how they develop. In this paper, I investigate how the introduction of patient safety technology in Danish health care is reorganizing work and redistributing responsibilities with new risks as a result. In recent years patient safety has emerged as a significant topic in health care discourse and as an important organizational concern in the health care system. In Denmark a patient safety law has been adopted, which oblige health care professionals to report patient safety errors and so-called 'adverse events' to a national reporting system. The reporting system's purpose is to make errors and adverse events visible and governable - that is, to identify, measure, analyze, and handle the events and hopefully, on this background, prevent others. However, in this paper I argue that the introduction of the reporting system is changing everyday practices in health care in ways, which are not simply reducing risks and errors but are equally likely to generate new and unanticipated kinds of risk. The paper's analysis and arguments are based on ethnographic fieldwork (observational studies and qualitative interviews) in two different Danish health care sites; a nursing home in which the reporting system is about to be implemented; and a hospital ward of a large university hospital, where the system has been part of work practices for a number of years. By analyzing the workings of the reporting system in these sites, I point to a number of immediate risks associated with the implementation of the technology, e.g. the time consumption spend on reporting events. Besides these more easily recognizable risks, the analysis points to a number of risk areas with less obvious, albeit potentially far-reaching consequences for the practice and understanding of health care. Among other issues, I explore how the construction of adverse events and errors as reportable safety objects is likely to increase the standardization of work practices. Furthermore, I examine how the introduction of safety technologies influences the overall understanding of safety and quality in health care with alteration of focus areas and redistribution of responsibilities as a consequence. Finally, the paper discusses the implications of these findings for the understanding and use of safety technologies in practice and for elaborating existing theories on the paradoxical consequences of such technologies. Bibliography Perrow, Charles (1984): Normal accidents - Living with High-Risk Technologies, Princeton University Press, New Jersey Power, Michael (2007): Organized Uncertainty - Designing a World of Risk Management, Oxford University Press, Oxford Strathern, Marilyn (2000): "The Tyranny of Transparency", British Educational Research Journal, vol. 26, no. 3, 2000

Nutrigenomics, healthism and food value pluralism. *raphaelle stenne, université de montréal*; *Thierry Hurlimann, Université de Montréal*; *Béatrice Godard, Université de Montréal*

Nutrigenomics (NGx) is a field of study that aims to understand the interaction between the genome and nutrition in order to reduce morbidity and to improve general public health through diet. Even though NGx is an emerging subject of research, a growing body of literature suggests that it has many ethical issues related to it. Some seem to arise from the application of high-throughput genomic tools and others are more related to the development of fundamental research. Nonetheless, very few of these issues are identified based on the analysis of the actual scientific literature that derives from this research domain; they rather concern the practical application of NGx. Because the development path of a new field is usually shaped by the discourse associated to the early phases of research, it is of

interest to examine the context in which NGx is actually growing to anticipate the related ethical concerns. A thematic analysis of the content of 174 published clinical research reports in NGx published between 1998 and 2007 was therefore achieved. The extracted elements were chosen in order to depict the actual situation of the ethical issues related to NGx so far anticipated in the literature and also to acknowledge the presence of unexpected ones. It first appeared that NGx' primary goal is to avoid the development of disease which basically means maintaining a "healthy status". This observation is consistent with what others reported. The notion of health being the main concern raised by NGx, the development of this emerging field of science may contribute to the promotion of the healthism ideology proposed by Robert Crawford in the 1980s. However, praising an ideal norm that might be difficult to achieve due to the complexity of the issues that surround NGx can be hazardous. Indeed, one premise of NGx is food medicalization, a notion that was introduced by Irvin Zola in 1972. It remains that food habits cannot only be contained and defined by the medical dimension due to their implication in several social aspects. Also, the distinction between healthy and sick individuals can become more difficult with the development of this expertise. Because it is embedded into multiple spheres of life, the promise of maintaining health with NGx becomes on the one hand difficult to achieve on a practical point and on the other, potentially stressful for individuals. In order to avoid setting a biohype trap, the statements articulated in the scientific literature should take into account that one of the core components of NGx is food which is an element closely bound with cultural and social life aspects. By considering these outer-medical aspects, the strategies suggested by NGx clinical research publications to move toward better health might have a better chance of succeeding while diminishing the anxiety relating to it. This research project is the first study to propose empirical data on the state of clinical research in the NGx field.

217. Science, Technology and Markets

1:15 to 2:45 pm

13: 1322

Participants:

University's research centers in medicine: science, market and society. *Luísa Veloso, CIES-ISCTE*; *Luísa Oliveira, CIES/ ISCTE-IUL*; *João Frutuoso, CIES/ ISCTE-IUL*

The university's research centers develop their activities in order to build up knowledge and to answer some social problems. One of the paradoxes within the research centers' activity is, on the one hand, the importance of research in order to enhance the researchers' scientific curricula and, on the other hand, to raise funds for their research activities. In between, it can be raised the question of the role played by public research centers in contributing to enhance the public good. As a beginning of a research project on this theme, it is proposed to reflect upon the role played by public research centers in medicine in promoting research and development activities and its relationship with market. To know their aims and to get acquaintance of research practices being held, stressing the relationship between research, innovations and market. Aiming to develop several ethnographical studies inside public research centers, in this paper it is proposed to present some results of the exploratory ethnographical research centered on one research center in medicine and some theoretical reflection about the relationships between the several concepts discussed. It is intended to present the analysis carried out of a set of interviews to researchers (leaders and team members) and some of the work resulting from observation. Stressing the possible conflicts between market demands and the requirements of the scientific evaluation it will be discussed the questions that can be raised about the contributions of research to the social common good. The relation of the research centers with the market - namely with pharmaceutical Industries - and how some research's results are commercialized emphasize the societal role of the university's research centers activity and main goals.

High-tech Hopes: Policy Objectives and Business Reality in the Finnish Biopharmaceutical Industry. *Juha Tuunainen, University of Helsinki*

From the 1980s until recently, biotechnology has been considered as a promising new industry in Finland. However, despite significant public support, the commercialisation of research results in this field has remained modest. In particular, small companies active in drug discovery have encountered substantial challenges in terms of divising suitable business models for the global pharmaceutical market. In the present article, these obstacles are illustrated by examining the trajectory of a small Finnish company that attempted to commercially profit from preceding academic research in pharmaceuticals. By addressing the reasons that led to the eventual down scaling of the firm's ambitious business plans, an interesting grass-roots perspective on the possibility of supporting the development of business activities through public policy measures can be attained. Through the analysis of interview and documentary data the paper outlines three such measures: 1) strengthening the public support systems of young high-tech companies, 2) developing the business models of those companies so as to gain income early and 3) focusing national efforts on building new industries in areas where some industrial tradition already exists. By so doing the paper increases our current knowledge on the various ways in which high-tech entrepreneurship can and cannot be fostered by means of public policy measures.

From academic molecules to new medicines in Brazil: a blocked pathway. *Carlos Henrique Fioravanti, State University of Campinas, Brazil*; *Lea Velho, State University of Campinas, Brazil*

A comprehensive, but perhaps non-exhaustive, survey found that over the last ten years Brazilian researchers "discovered" 28 pharmacologically-active molecules and published their results in high impact scientific periodicals. In all cases, soon after the scholarly publication or even at the same time, such molecules were publicized to the general public in newspapers, magazines and TV programs as promising medicines. The scientists leading each one of the research teams that produced the molecules, interviewed by journalists, stated that their molecules would soon be evaluated in humans and would be available as a medicine in a few years. Taking together, the molecules were said to represent new hopes against cancer, tuberculosis, pain, inflammation, arterial hypertension, Alzheimer disease, arthritis, epilepsy, mycosis, and ulcer, as well as typically tropical health problems such as Chagas disease and schistosomiasis. Yet, after a decade of the scientific and public announcements none of the molecules have advanced in their development path to become a medicine and the promises of the researchers have not been fulfilled. In this study, with conceptual and methodological support of the Actor-Network Theory, we followed the scientists "responsible" for each molecule in order to understand how they built networks, how networks evolved and functioned, how interests and actors were mobilized. We did this, however, with an eye to unveil possible "regular patterns". That is, as we performed a significant number of case studies of "similar nature", we sought common explanations for the lack of success so that it would be possible to obtain policy relevant results from your study. We have observed that all scientists received substantive grants from government research funding agencies to do their research and to request patents, but later had a weak institutional support to progress in the development of the medicine candidate. The scientists have searched by themselves for pharmaceutical companies which could perform toxicological tests and human trials in order to better evaluate the pharmacological and commercial potential of the molecules. The dialogue hardly advanced, as companies asked for more pre-clinical tests that scientists could not perform in public research center laboratories. Sometimes companies agreed in examining the prospective of licensing academic molecules. Later, though, companies lost interest, concluding that they were not able to perform the tests necessary to develop the new medicine or that

the tests would be too expensive. We concluded that new drug development in Brazil lacks mediators to evaluate the relevance of the molecules, to help scientists organize and complete initial tests, and transform scientific data on commercially convincing arguments.

From Textile to Textual: Spatial Transmutation of the Textile Company Brasil Industrial's Buildings in Paracambi - RJ. *Eduardo Nazareth Paiva, Instituto Superior de Tecnologia de Paracambi - FAETEC - RJ*

The flow of sociotechnical transformations produces materialities that can be observed through the transmutation of areas affected by them, leaving over the time, a legacy, in general, larger than that left by the flow of power. Within this context, the textile factory space was one of the greatest inspirations, one of the largest laboratories and one of the main "victims" of the trajectory of Fordist production models. In Brazil, particularly in Rio de Janeiro, starting from the second half of the 19th century, many buildings were built for the installation of textile manufacturers. These enterprises experienced their heyday in the first half of the 20th century. During that time they were all place of important local sociotechnical framing. However, in the early '70s, the Recession and the Oil Crisis triggered a set of processes that eliminated the Fordist's commitments of then. This framework led to the consolidation of new models of accumulation and production, characterized by the fluidity and flexibility. This culminated in the late 80's with the so-called "Markets Opening" and the consequent changes in the flow of capital and its investment centers. Thus it was the consolidated end of this classic cycle of the textile industry in Rio de Janeiro and with it the sad closing of buildings, usually monumental and with alien architectural styles. Many of these buildings were, after several negotiations, turned into shopping malls, with some aspects of strategic and cultural venues, such as safe parking areas, compensating former liabilities. This paper will focus on "Textile Company Brasil Industrial", founded in 1870, in the city of Paracambi, Rio de Janeiro, the first and the largest textile manufacturer of cotton in Brazil, by its time. Its introduction promoted a symbolic clash between local agrarian culture and the projected industrial modernity, represented by human actors, such as British entrepreneurs and other non-human actors, for example, its buildings, its machines, its time clocks, its workers' village, etc. After the closing of " Textile Company Brasil Industrial ", in the late 80's, opens a period of great controversy, which led to its toppling by the State Institute of Artistic and Cultural Heritage (INEPAC). But it was in the early years of the third millennium that their buildings were acquired by the local prefecture, in a daring postmodern project of turning it into a "Knowledge Factory", through the entanglement of the flow of public policy actions of the municipal, state and federal powers, in order to install there teaching units, research and outreach at all levels. Faced with more controversy, various institutions and courses have been deployed there, all of emphasis and informational production, for example, a course in Information Systems, taught at the Instituto Superior de Tecnologia FAETEC-RJ (College of Technology FAETEC-RJ). This paper will analyze, from an approach based on the Actor-Network Theory, the current results of these controversies, which are being able to transmute an area of textile manufacturing in one place of educational textual production.

218. Thomas Kuhn, Knowledge Management, and The Intellectual: A Fuller STS?

1:15 to 2:45 pm

13: 1331

Session Proposal: 2010 marks the Japanese publication of three books by Steve Fuller, a leading STS theorist. Their original English versions are Thomas Kuhn: A Philosophical History for Our Times (Chicago, 2000), Knowledge Management Foundations (Butterworth-Heinemann, 2002), The Intellectual (Icon, 2005). This session will take stock of the relevance of Fuller's work in both Japanese and more international settings relating to STS. Amongst the issues that will be considered the 'Kuhnification' of STS (i.e. the extent and consequences of STS having a dominant paradigm - both in Japan and elsewhere), the implications of neo-liberal knowledge management for what Fuller calls 'the governance of science', and the sense that can still be given to 'epistemology' as normative foundations for knowledge in what John Ziman has called a 'post-academic' scientific environment. Three papers by Hideto Nakajima, Francis Remedios and Verusca Reis address these matters, respectively. Comments will be provided by Yoichiro Murakami (one of the translators of The Intellectual) and Steve Fuller himself. The session is chaired and organized by Hideto Nakajima.

Participants:

Kuhnification of Japan—How did Kuhn Change Japanese Science Studies?'. *Hideto Nakajima, Tokyo Institute of Technology*

In this talk, I will discuss Kuhn's influence on Japanese academic setting, especially on science studies. The Japanese version of the Structure of Scientific Revolution was published in 1971. Its translator was Prof. Shigeru Nakayama, an iconic researcher for new left students, and a classmate of Everett Mendelsohn at Harvard. Prof Nakayama was affiliated to the Dept of Cosmic and Earth Sciences, University of Tokyo, Komaba Campus, where the academic history of science, another aspect of Kuhn's research, was also established. Prof. Chikara Sasaki a student of Kuhn who returned from Princeton in 1980, started to organize seminars at HPS in American style. History of science, which still had been a 'hobby' of scientists, was gradually changed into an academic discipline. How direct was the social influence of Kuhn's theory of paradigm? It was used to defend 'New Science'. Just as American case that Steve Fuller describes, it was believed that the theory legitimized not only ecology but also parapsychology, mysticism & so on (Chap. 5, Sec.4, Thomas Kuhn: A Philosophical History for Our Times). In this situation, Marxist camp was divided into two. As the American case, new left activists warmly accepted Kuhn's theory of science (ibid., Sec. 5). But orthodox Marxists were disturbed by it in 1970-80. Scientists were rather positive to it as the case of Prof. Y. Ito. They argued that Kuhn's model is useful for their practice. But philosophers, like Prof. A. Nakamoto, harshly criticized it as relativism. In my paper (EASTS Journal, Springer, vol. 1, no.2, 2007), I showed that Japanese science studies were formed under the strong influence of Marxism. But after this disturbance, and especially after the end of cold war, it became increasingly rare to see Marxist science studies. The discipline (now re-named as STS) seems to be monopolized by SSK and post-modernist analysis of science. Critical analysis of science was lost, and HPS researchers indulge in academic research. In sum, Kuhnification was completed. But it is worth noting that it accompanied the process of Americanization of Japanese academic setting. Telling is that Kuhn's influences came mainly through Komaba campus of University of Tokyo, where international relations and area studies -- typical American disciplines -- were institutionalized.

'Fuller and Mirowski on the Commercialization of Scientific Knowledge'. *Francis Remedios, Independent Scholar and Editorial Board Member, Social Epistemology*

As a problem for science studies, the commercialization of scientific knowledge is characterized as whether scientific knowledge is a public good, like health care and education, or a positional good, a good whose value allows for exclusion of clients, the opposite of a public good. The commercialization of scientific knowledge may have epistemic impact and is at odds with the democratization of scientific knowledge. In this presentation, I will discuss how commercialization of scientific knowledge is interpreted in the works of Philip Mirwoski, an institutional economist who has been critical of actor-network theory in STS and Steve Fuller, who advocates a republican approach to the governance of science. On the one hand, Mirowski avers that commercialization of scientific knowledge is the apotheosis of a Neoliberal program to promote and to construct free markets as the central condition for all of society, not least science, which is especially harmed in the process. Mirowski argues that the heart of the problem of

commercialization of scientific knowledge is that scientific knowledge is being transformed from a public good to a positional good. Fuller's social epistemology approaches the matter somewhat differently. He is interested in what he calls 'knowledge policy', which upholds the idea of knowledge as a public good through a defence of the university as a bulwark against Neoliberalism. Fuller holds to a two-stage model to reorganize science. First stage is basic research is separated from the state and privatized and commercialized. Second stage is state-funded universities would test and distribute privately generated knowledge. In this way, he argues, scientific knowledge is transformed from a positional good, which is research done by private corporations, to a public good, which is distributed by universities.

Chair:

Hideto Nakajima, Tokyo Institute of Technology

Discussants:

Steve Fuller, University of Warwick

Kei Yoshida, University of Tokyo Center for Philosophy

219. Hospitals, Patients and Technologies

1:15 to 2:45 pm

5: 512

tba

Participants:

Deployment of communication - configurations of the relation between patient and hospital. *Anja Svejgaard Pors, Copenhagen Business School, Department of Organzation*

Currently new tasks and methods of organizing are emerging in connection with the strategic endeavours of public Danish hospitals. The paper sets of from an empirical observation that communication has become a separate professional discipline at hospitals beside health care professionalism. Communication does not only target the clinical face-to-face-interaction between patient and health care professional, but signifies strategic policies and actions created of and facilitated by communication professionals, which heralds an increasing professionalization of communication as a discipline. Communication is an example of what I choose to refer to as an extra-clinical activity institutionalized in the health care system. The paper explores how a communication strategy at a Danish hospital is being performed in a micro-setting, where communication consultants and health care professionals are collaborating. Through an empirically based analysis of information material on planned caesarean for pregnant women, the paper analyzes the relation between hospital and patient as it occur in the strategized deployment of communication. By analyzing patient communication as an organizational focal point I hope to establish room for reflecting upon the implications of how extra-clinical practices stemming from human and social sciences are intertwined with logics of medical professionalism. The analysis is constructed on the basis of a variety of qualitative methods. The empirical material primarily consists of different versions of a patient information leaflet, which is informing pregnant women about planned caesarean. The analysis of the leaflet's text and illustrations is combined with data from ethnographic fieldwork. I have carried out participant observation of a collaboration meeting, where communication consultants and health care professionals are revising and developing the leaflet. The empirical material also consists of qualitative interviews with the actors and collected written material. The analysis digs into how strategic deployment of communication configures the relation between organization and patient in different versions. Following Mol (1999, 2002) and Dugdale (1999) the paper investigates how local, situated practices related to a delineated organizational task contain a story of organizational and relational multiplicity. I argue that the creation of a patient information leaflet is on the one hand a story of convergence, where competing views on patient roles and versions of the object 'planned caesarean' are stabilized in the compromise of a singular leaflet - but on the other hand the content and form of the leaflet contains different traces of relational and organizational multiplicity. The roles, positions, tasks and choices of the pregnant woman are multiplied and different modes of doing planned caesarean occur. The analysis identify four separate but linked genres of the object; planned caesarean as a clinical situation, as responsible choice, as private and intimate experience and as organizational optimizing. The paper discusses the implications of these findings for the understanding of how practices of representation not just constitute different perspectives on subjects and objects, but perform the proliferation of both ontological sameness and difference.

Communication-mediating technologies in the hospital; exploring adoption and domestication strategies. *Pieter Toussaint, Norwegian University of Science and Technology*; *Ero Karlsen, Norwegian University of Science and Technology*

This paper discusses communication-mediating technologies in a hospital setting. More specifically we focus on communication 'breakdowns' generated by these technologies and the strategies applied by health personnel to cope with these breakdowns. The work reported here is part of a large research and development project in which the requirements are elicitated for information systems that supports coordination in hospital settings. Communication is seen as one of the main means to achieve flexible, 'just-in-time' coordination of work in these highly collaborative and dynamic work environments. And IT-support for communication must be a main function of such a system. Our study is situated within the STS-field, emphasizing the mutual constitution of the material and the social and the performative powers of technological artifacts. In addition, we draw on communication theories that focus on the information exchanging aspect of communication, as well as on the social context in which the communication takes place. Methodologically, we have studied three communication-mediating technologies that were used at a geriatric ward of a large Norwegian academic hospital. The first technology was the pager, a well-established and proven technology. The two others were new technologies: an IP-phone system enabling wireless communication and messaging, and a system for signaling nurse attendance to patients. The observations showed an interesting dichotomy between the 'old' and the 'new' technology. In the case of a communication-breakdown with the paging system, no alternative communication strategies were put to use in order to cope with the breakdown. It was more or less accepted. However, the two other, less proven technologies were embedded in a context of alternative communication strategies that were used in the case of breakdowns. We suggest that these findings indicate an adoption process in which users only gradually trade in their alternative, well-proven communication strategies for trust in some communication-mediating technology. The design and implementation of communication-mediating technology must take this into account by explicitly identifying which communication strategies are alternatives for the functionality offered and how the technology can be implemented in such a way that it can co-exist with these alternatives. We argue that it is necessary to take both aspects into account when analyzing the empirical material and informing the design and the implementation process of communication-mediating technologies.

Inscriptions of discipline and control in health information systems: Implications for health care practices. *Erna Håland, NTNU-ViLL*; *Line Melby, Norwegian University of Science and Technology*

The electronic patient record (EPR) has been introduced in most hospitals in Norway, and many health care institutions have electronic message systems. These technologies are interpreted and used by health personnel in several different ways. In this paper, the focus is upon how elements of discipline and control are inscribed in these technologies, as it is experienced by health personnel. The material for this study comes from two different case studies in Norway; the introduction of electronic patient

record in a large university hospital, and the introduction of an electronic message system between a hospital and the municipal health care. Based on semi-structured interviews with different groups of health personnel, as well as with people from the regional health bureaucracy and technology department, we investigate: How are discipline and control inscribed in electronic patient records and electronic message systems, and what are the implications for health care practices? We find that these technologies, as they are perceived and used by health personnel, imply discipline and control regarding documentation of patient information, use of time, access to information, and the relations between different professions. Health personnel report that the use of these new technologies has a disciplining effect, meaning that they take greater concern in what and how they document (because electronic texts are easier accessible); they keep the patient as an 'invisible reader' when they document. Further, they experience that these technologies frame and restrict how they use their time; more time is spent in front of the screen and less time is spent with the patients in a face-to-face relation. EPR and electronic message systems also imply control of legitimate access (and access can be traced) to information, which again have implications for the relations between the professions (for example nurses now have the right to read and write in the record, which they did not have before). Possible surveillance by the management is another implication, as it is easier to control what is documented by whom, also regarding required documentation by the government. Contribution to the STS-literature: This paper is a contribution to the broader STS-literature on health/medicine and technology. We make an effort to understand more of the complex and multi-faceted relationship between the introduction of technology and change of practices, using the concepts of social construction, flexible interpretation and inscription.

Tracing associations of the unforeseen in clinical work. *Line Melby, Norwegian University of Science and Technology*

This paper looks into how health personnel in a surgical ward in a Norwegian university hospital cope with unplanned and unforeseen events in their work. The aim is to obtain a better understanding of what these events are and how they are dealt with by health personnel. Clinical work, and particularly surgical work, is characterised by on one hand being highly regulated through plans, guidelines, procedures etc., and on the other hand by being unpredictable and difficult to control in detail. The development of e.g. plans and procedures are attempts to control the unpredictable nature of clinical work, but a residual of unforeseen events will always exist. This residual of events must be dealt with in an improvised, flexible manner. The work, which this paper is based on, has been conducted within the frames of a broader research and development project, COSTT (Cooperation-support through transparency). The overall objective of this multidisciplinary project is to create a computerised shared work space that gives health personnel in surgical wards real-time insight into the work process as it is unfolding. Our work is based on an underlying assumption that it is useful to obtain insight into how health personnel work (e.g. what resources they draw on, how they communicate, how they cope with problems) in order give design suggestions. In the first phase of the project we draw on a combination of methods, comprising participant observation, semi-structured interviews with a number of health care workers and investigations of current computerised systems used in the Department of Surgery in a Norwegian university hospital. This paper is based on these data. In our exploration of the character of the unforeseen in surgical work, and how health personnel cope with these events, we are inspired by ANT. Our aim has been to trace the associations that make up the 'object' of these unforeseen events that health personnel are facing. We provide examples of unforeseen events, and we discuss how the hospital and how health personnel develop strategies for coping with these events. Our paper may be placed within a long tradition in STS, studying the production of clinical work and medicine. ANT has proven to be a useful intake for understanding such work and offers an interesting perspective, emphasising the complexity of clinical work and the multiplicity of meanings attached to medicine.

220. Technological Innovation and Cultural/Global Contexts (2)

1:15 to 2:45 pm
5: 513

Participants:

A Textual Research on Professional Awareness of Ethics in up-to-date Constitutions of Chinese Engineering Societies. *Junbin SU, School of Journalism and Communication, Xiamen University*; *Nanyan CAO, Center of STS, Tsinghua University*

Is there any profession of engineering in China mainland? (Michael Davis et al) That means that do Chinese engineering societies openly serve a moral ideal in a morally-permissible way beyond what law, market, morality, and public opinion would otherwise require, in written form or not. The purpose of this presentation is to examine the professional ethical awareness in constitutions of engineering public organizations. This research is focused on engineering codes of ethics as the central formulation of the ethical obligations of engineers, and collected 46 constitutions of nationwide engineering public organization in China up-to-date, and the constitution and scientific moral code of Chinese Academy of Engineering. Based on these documents, we analyzed professional ethical awareness of Chinese engineering collectivity. The findings of this research can be concluded as below: 1.Chinese Academy of Engineering (CAE), the highest level honorary and consultative academic organization in Chinese engineering technological world, stipulated academicians' scientific moral codes and some self-discipline regulations of academicians' scientific moral codes. Both came on in response to allegations of scientific misconduct, where we can only find obligations to science not to engineering practice. 2.There are 64 nationwide societies related to engineering in China, without any codes of ethics except for China Computer Federation (CCF). But the codes of ethics of CCF are also scientific moral codes. We have collected 46 constitutions of these societies, in which no ethic consideration has been clearly expressed. 3.World Federation of Engineering Organizations (WFEO), under UNESCO, formulated a model code of engineering ethics for its member organizations, and reversed it in 2001. The model code of ethics presented herein expresses the expectations of engineers and society in discriminating engineers' professional responsibilities. However, the model code of engineering ethics does not affect the constitutions of Chinese engineering societies at all. 4.Even engineering disasters arousing public attention have not awoke leaders of those engineering societies to upgrade ethical standard of engineering professional behavior. We can not find any change in the purpose of China National Coal Association about safety and health of mineworkers after so many mine disasters. Foods safety and health are not mentioned in the purpose of China Cereals and Oils Association, etc. 5.Chinese engineering organizations (Mainland) lack of legible and comprehensive cognition about ethical responsibility of engineering, and a moral ideal in a morally-permissible way beyond what law, market, morality, and public opinion would otherwise require in their written constitutions and in their minds up-to-date, though ethical obligations of engineering have become important part of qualification standard for Chinese registered engineers. Both CAE and engineering public organizations take themselves as academic groups not as societies of professional engineers. 6.If we could say that Chinese government, science community and public have attached importance to scientific research integrity/ethics to some extent, then we must say that there is more work to do about ethics of engineering. Revising the texts of constitutions and formulating codes of ethics are prime steps, reforming the systems and improving engineering education are also necessary steps.

Building a Greener Aircraft: Issues and Obstacles. *Graham Spinardi, University of Edinburgh*

This paper addresses the challenge of reducing the environmental

impact of air travel through improvements in airliner technology. Recent studies of greener airliner designs show that more environmentally airliner technology has been available for many years. However, the dominant design appears to have become 'locked-in', making a paradigmatic shift hard to achieve. This paper looks at the factors that have led to this lock-in, and suggests policy options that could be used to overcome it. Although not the largest contributor to greenhouse gases even from transportation, air travel is growing, conspicuous, and hard to regulate. Despite calls by environmental campaigners for people to fly less, it seems unlikely that there will be a significant reduction in the upward trend. There is thus an urgent need for major environmental improvements in passenger aircraft technology. Potential improvements are available in three main technological areas: more energy efficient engines; lighter structural materials; and more aerodynamic aircraft shapes. What is interesting is that these more fuel-efficient approaches have been available for many years - these include turboprop engines, materials such as carbon fibre, and flying wing airframes. However, these have either been introduced very slowly (carbon fibre), are only now used for certain short-haul routes (turboprop engines), or have not been used at all (flying wings). Although fuel-efficiency has always been of some importance - fuel costs constitute a significant part of airline companies' budgets - these more fuel-efficient technologies have not been prioritized. This paper sets out the argument that this has happened because a paradigmatic approach to airliner design - typified by the Boeing 7x7 series of aircraft - has become 'locked-in'. It appears that more environmental technologies have not been widely adopted because they do not fit easily within an approach based on incremental improvement of the classic airliner design. This analysis will investigate the processes that favour incremental technological change over radical innovation, and provide insight into what policy options might overcome this resistance and thus speed up the transition to less polluting airliner technologies.

Learning and (environmental) knowledge acquisition in CEF's. *Thea Hojem, Norwegian University of Science and Technology*

Consultant engineering is a profession that engage with important and wide-ranging environmental issues related to, for example, physical planning, construction of buildings, transport and water-management. Their main expertise resides in technology and architecture, and these companies play a key role in the ongoing shaping and reshaping of the physical qualities of nature and culture, of landscapes and the built environment. This paper is a study of the flows of knowledge that take place in and around consulting engineering firms (CEFs). What does these knowledge flows look like and what implications do they have for the attention given to environmental issues? These questions have traditionally been seen as related to the more general issue of the transfer of knowledge from scientific institutions to practice/action. There are several conventional models. Probably, the most traditional one is the trickle-down view, which holds that good research will be taken up by practitioners without additional effort required. This model gives the impression that science itself is an effective agent in bringing about change. According to this model, scientists set the research agenda, do the research, and transfer the results to users. Results then diffuse through the practice community. Critics have pointed to serious flaws with these models (Kline and Rosenberg 1986, Latour 1998, van Kerkhoff and Lebel 2006). Many of the assumptions underlying the models are untenable. The actors, knowledge components and processes of transfer are far more diffuse and changing than previously assumed (cf. Woolgar 1994), and the interaction between research and practice is too ambiguous and complex to be represented in such ways. In our previous research it seems the knowledge acquisition in CEFs is driven more by problem solving and the need to fulfill such requirements, rather than being driven by new knowledge. How is environmental knowledge acquired by CEFs? And what are the main sources for environmental knowledge? This paper is based on in-depth interviews with consultant engineers about their practice, and interviews with central actors and knowledge producers both in the university sector and in the industry.

221. Identity within Science

1:15 to 2:45 pm

5: 514

Participants:

Social media and hybrid social connections in wildfire activities. *Naoki Ueno, Tokyo City University*

Modern days can be regarded as the period when wildfire activities (Engestrom, 2006) are expanding more and more. The term wildfire activity refers to the phenomenon that distributed, local activities, communities are shaped everywhere simultaneously and intertwine each other in various ways. In wildfire activities, on the contrary to the topdown bureaucratic organization, distributed activities and communities are locally shaped and mutually interconnected in complex ways such as rhizome. The activities of red cross, skate boarding, graffiti and community building by local people themselves are the prototypical examples of wildfire activities. Social media in web and mobile is accelerating expanding of wildfire activities and of complex interconnections among activities, communities and people. Social media shapes hybrid social space combined with wildfire activities in various places such as streets, local areas, and individual rooms. The examples of shaping hybrid social space can be shown in the activities of community building by local people, in the cultural consumption and production in communities of subculture such as Geek. Geek is young web engineers who are developing Web2.0 system or social media. These are, rather, the limiting cases of shaping hybrid social space. However, it seems that we can see the futures of hybrid social spaces and of wildfire activities. Thus, in my presentation, first of all, I attempt to make visible hybrid social connections in various modern wildfire activities such as community building by local people and cultural consumption and production in communities of subculture such as Otaku and Geek. Second, I clarify how the future design of hybrid social spaces are, base on the field research on concrete hybrid social spaces and on the case analysis of practices of development of social media. This presentation is based on the research project called 'the design of communication platforms in Newtown utilizing ICT: Gathering local information, and promoting and supporting local activities via web2.0 technologies'. In this project, we attempted to build the new connection among people who are conduct the activities of community building and Geeks who are developing social media. By building the connections, we developed the social media systems utilized in the activities of community building such as electric map systems and microblog systems. In this project, we did not only develop the social media systems but also conducted the activities of expanding wildfire activities. By doing so, we attempted to establish the hybrid social connections in wildfire activities. The description of hybrid social connections in wildfire activities in my presentation is base on our own activities of community building shown in the above.

Group Identity of A Scientific Community in Democratic Society: A Global Comparison. *So Young Kim, Korea Advanced Institute of Science and Technology*

With their authority and zeal for knowledge creation through discovery and innovation, scientists and engineers often position themselves and are perceived by the public as an expert group transcending the nitty-gritty of daily politics. Such "neutralization" or "purification" of science from politics collides with a more practical perspective viewing a scientific community as just one of many interest groups whose competition for public money and attention epitomizes democratic pluralism. This study searches for empirical evidence for those two perspectives by comparing expert and public perceptions of group identity of a scientific community across different societies. A preliminary analysis of three crossnational surveys (Eurobarometers, Pew Global Attitudes Surveys, and World Values Surveys) and of the

interviews of thirty-seven scientists of different nationalities reveals significant differences both across countries and between experts and laypeople in their understanding of roles and identities of scientists in democratic society. The study then examines and tests potential causal explanations for those crossnational variations based on contending models of democratic politics - institutionalism, elitism, pluralism, and the rational choice model. The study's findings essentially provide empirical support for the socially contingent nature of a scientific community and the perceptions thereof.

Cloudbusting: Internetworking, Embodiment and Community. *Jean Hébert, Simon Fraser University*

It is perhaps unsurprising that the sociality of the Internet - and specifically, the sociality of communities of practice comprised of both the developers of its constituent software and creators of its media content - poses serious questions about our conceptions of identity and community. Competing ideologies (hacker/maker/open source as against logics of multinational capital) play out in the milieus of Internet software and media, and are inscribed in the functionality of software as well as in cultural codes of conduct for Internet users. It is perhaps surprising, on the other hand, to note that in some cases participants in these technical networks come to be seen (and see themselves) less as individual agents of change and more as "operators" of a vast technical system, or component parts of broader collectivities (human or digital). This observation opens up a unique opportunity to rethink collective action and collective consciousness in terms of theories about technology. This paper explores changing conceptions of identity and collective action in digitally mediated networks of practice. Using as a theoretical starting point Katherine Hayles' critical framework of embodiment and prosthesis (but with a hindward look at the history of social constructivism and technology) I compare and critique public conversations in two social media community case studies - Wikipedia and the Drupal development community. Doing so opens a dialogue with fantasies about post-humanity and sociocultural change, fantasies that are seen to operate in both networks. More specifically, this exploration invokes both utopian and dystopian fantasies about collectivities (e.g., the emancipation/disembodiment of "cloud computing"), and the notion of "uploading" of all of humanity into a digital network.

One, none and one hundred million profiles: Rereading the Pirandellian identity dilemma in the era of Facebook. *Alberto Pepe, University of California, Los Angeles*; *Karen Van Godtsenhoven, Ghent University*

With the growing permeation of online social networking sites in our everyday life, scholars have become interested in the study of novel forms of identity construction, performance, spectatorship and self representation onto the networked medium. This body of research builds upon a rich theoretical tradition on identity constructivism which includes Sartre's subjectivity/objectivity of Being and Nothingness, Michel Foucalt's interrogations on identity and surveillance in the Panopticon, Judith Butler's perspective on the discursive nature of identity, Erving Goffman's theory on the performance of contextual identity, and Susan Sontag's work on photographic evidence, to name a few. This paper is an attempt to bring the work of Italian playwright Luigi Pirandello into this tradition. In particular, this paper focuses on Pirandello's classic novel "One, No One and One Hundred Thousand". This novel recounts the tragedy of Vitangelo Moscarda, a man who struggles to present a coherent identity of himself to an inherently social and multi-faceted world. In the narrative style of the bildungsroman, Moscarda recounts his troubled experience of identity as a first-person narrator. Upon suddenly, unexpectedly discovering that he has a tilted nose - something he had never noticed before - Moscarda begins to question his own public image and perception. He apprehends that his acquaintances have constructed, in their own imagination, "one hundred thousand" Moscardas that are different from what he believes himself to be ("one"). A dramatic journey begins, in which Moscarda performs a number of social experiments in the attempt to discover his own self. In this paper, I reread Pirandello's novel: Moscarda's experiences, experiments and exploits in identity. In particular, I translate the novel's narrative from its original locale --- a small town in Northern Italy in the early twentieth century --- to the present era of social networked media. In other words, I imagine how the same story would have unfolded, had Moscarda been a user of Facebook or a similar social networking site. In re-reading and remixing the story, I demonstrate how the original offline, place-based events would play out onto the contemporary online stage, where physical connotations of identity intersect with online forms of self presentation on social media.

222. APSTSN Steering Committee

1:15 to 2:45 pm

5: 516

223. Challenges for Institutionalization of New Generations of Technology Assessment

1:15 to 2:45 pm

5: 521

A first generation of technology assessment (TA) was developed by dedicated parliamentary organizations in the United States (OTA, now defunct) and Europe over the 1970s and 1980s. A second generation, with more emphasis on public debate and societal agenda building, emerged in the late 1980s and 1990s in Europe. By now, TA abounds in a wide variety of institutions and activities in many countries. Its concepts and methodologies have evolved to include relationships between science and technology and society as a whole, forging a close link with other kinds of strategic intelligence that includes foresight, road-mapping and evaluation. Intermediaries such as funding agencies, liaison offices, standardization organizations, intellectual property management firms, industry users, science communicators and journalists increasingly play an important role as practitioners, clients and addressees of TA. They are also mediators in facilitating knowledge exchange between TA institutions and societal decision makers. Activities before and after the assessment are becoming an integral part of TA - i.e., agenda-setting and outreach. The governance of technology is being dynamically reconstructed as contingent, reflexive and anticipatory, and the situation requires redistribution of intelligence, actors and power within and outside of the existing governance. These are opportunities for TA to further renew itself. The challenge for new generations of TA is to become institutionalized, so as to have effects, while maintaining openings. This session will offer analysis and diagnosis of ongoing developments in TA (institutionalization and practices) and evaluates them by putting them in broader frameworks.

Participants:

Third Generation of Technology Assessment. *Go Yoshizawa, University of Tokyo*

Recently emerging trend in TA activities across the world might be characterised as the third generation of TA (3G-TA), by comparing the first (expert-based, parliamentary-centred) and the second (involving selected citizens, parliamentary-related) generations. 3G-TA is not necessarily based in an established organization, but rather in a flexible distribution network of existing intellectual and human resources, facilitating active engagement of lay public as well as intermediate actors between experts and technology end users. Methodologically, 3G-TA may involve external stakeholders and experts as responsible practitioners, or collect intelligence through systematic review of existing research and literature. Institutionally, it may distribute supportive actors (informally) as agents for TA activities to a variety of established organizations, or commission a part of TA activities to interested individuals and organizations. This presentation illustrates several ongoing 3G-TA exercises on medical, food and energy nanotechnologies for the "Innovation and Institutionalisation of Technology Assessment in Japan" (I2TA) project. The medical case focuses on drug delivery systems applying nanotechnology (nano-DDS) and organizes a stakeholder roundtable three times to facilitate their collaborations on the assessment. The food case takes in the whole but ambiguous concept of food-nanotechnologies and sets

a critical agenda for this issue by holding an expert-consumer group meeting. It also develops a participatory interactive web database system providing information about a wide range of implications on these technologies. The energy case also takes nanotechnologies closer to the consumer side. Through the articulation of energy-efficiency house applying nanotechnologies, it opens up discussion on the future living reflecting expertise and plural public values and examines desirable houses and potential benefits and risks of nanotechnologies possible for these houses.

Possible TA Institutional Options in Japan. *Hideaki Shiroyama, University of Tokyo*

TA-like activities abound in Japan, but these are unlikely to respond to policymaker's needs and social trust in terms of comprehensiveness of issue perspective as well as inclusiveness of technological and social uncertainty and plurality of values. Given such Japanese contexts, this presentation illustrates several possible TA institutional options and discusses effective actions for the Institutionalization. First, it explores national bodies, whether in the parliament or in administrative agencies as TA institutional options. Second, an independent agency funded from a certain part of the governmental R&D funding scheme, like in the case of 21st Century Nanotechnology Research and Development Act in the United States. Third, there can be TA activities not only based on direct investment from the government, but also funded by public research institutes and private firms. The discussion is also to be directed to staff recruiting, education and management.

Technology Assessment of Emerging Technologies - The Next Steps. *Arie Rip, University of Twente*

Increasing political and social interest in newly emerging technologies, with genomics and nanotechnology, and now also synthetic biology, as main examples, has been accompanied by new approaches to technology assessment. Constructive TA (Rip, Misa and Schot 1995) and the later (and similar) Real Time TA (Guston and Sarewitz 2002) are important examples. This overlaps (in terms of methods) with the emergence of ELSI (in the US Human Genome Project of the 1990s) and ELSA (in a range of European projects, now also in dedicated programs of funding agencies, e.g. the Research Council of Norway). The key challenge in doing TA of emerging technologies is how they live on promises of future performance and eventual impact. Expectations about their performance are 'technology fiction', and assessing impacts will be a form of 'social science fiction'. Thus, scenarios have become important as an approach, together with interactive workshops and (some) public engagement/deliberation. The attendant risk of getting lost in 'speculative ethics' has been signaled (Nordmann and Rip 2009). While it is not quite clear what the outcomes and effects of doing TA of emerging technologies are, the approaches are becoming stabilized, almost like a best practice. It is time to consider the overall picture. Late-modern societies have to come to terms with newly emerging technologies, manage (or at least) handle their promises as well as the social and political fractures (and occasional contestation) that accompany them. Present TA approaches may be 'best practice' for the different specific technologies, but if the same problems appear again and again, there is occasion to take a step back and ask for an assessment of newly emerging technologies in general and how they are, and could be, handled. This merges into a diagnosis of our late-modern, technology-intensive societies oriented towards never-ending innovation. Diagnoses of technology and society have a longer history (definitely since World War 2). Almost all of them tend to see technology as coming in from the outside and impinging on society. TA approaches (and especially ethics) are then seen as a counterweight (technology harassment). With newly emerging technologies, however, we can't say they're coming in from the outside. We are responsible for their emergence. Thus, a different kind of diagnosis of technology and society is in order. It can profit from the experiences with TA of emerging technologies, and the reflections on these experiences. Such a diagnosis will then also be able to offer improved perspectives on TA of emerging technologies. The paper will locate such diagnoses in terms of reflexive governance (Voss et al. 2006), and develop concrete implications for "next steps" in TA of emerging technologies.

Parliamentary Technology Assessment Institutions Challenged by Reflexive Modernization in Action. *Pierre Delvenne, University of Liege*

The emergence and evolutions of Parliamentary Technology Assessment offices (PTAs) are an indication of our Western modernity becoming more reflexive. This perspective sheds light on recent evolution of PTAs, but also contributes to the discussion of reflexive modernization generally. Ulrich Beck's diagnosis of reflexive modernization, undermining high modernity since the 1980s, has been widely discussed, but there have been few attempts to map and analyse these complex processes empirically in order to show reflexive modernization in action (Delvenne and Rip 2009). From that perspective, reflexive modernization is seen as a challenge for the institutions of modernity. PTAs are recent institutions that had to span boundaries from the beginning, and might thus have more incentives to follow reflexive modernization while at the same time their progression will be bounded by strong modernist institutional patterns or elements of political culture. We offer case studies of European PTAs based on literature research, participatory observation, official document analysis and qualitative data collection (through semi-structured interviews with academics and TA practitioners). We are particularly interested in how much reflexivity is visible in their institutional path. After formulating two main dimensions of reflexive modernization, openness to plurality and blurring of boundaries, we map the paths of these institutions over time along these two dimensions. There appears to be an overall reflexivity pathway, on which some PTAs have moved farther than others, but their progress is fractured by the resilience of modern institutions. This is due to various institutional factors ¬— like the link with a Parliament — and external factors — like the dynamics of institutionalisation, the cultural meanings and traditions, the historical processes or the structure and the state of the innovation regime — all of which affect the way institutionalised TA embraces a more or less reflexive approach. The identification of an overall reflexivity pathway allows us to highlight new trends in (parliamentary) Technology Assessment as not just interesting ad-hoc novel approaches, but as indications of a new and broader generation of TA.

Technology Assessment at the French Parliament (1992-2008) - A Case for Weak Institutionalisation. *Pierre-Benoît Joly, INRA*

In France, governance of technology has traditionally been marked by a technocratic regime, epitomized by the Nuclear Energy Programme. New technologies used to be designed and implemented out of public view and without any overview of the French Parliament. Since the 80's this technocratic regime has progressively changed, as a result of a bunch of external transformations (Europeanisation, Globalisation) but also internal ones (crisis of legitimacy of public decision making, New Public Management, etc.). As part of these transformations, the Parliamentary Office for the Evaluation of Science and Technology (OPECST) was created in 1983 on the model of the US OTA, as a way to recognize that the Parliament had to have its own capability to assess technological choices. In this paper, I analyse the transformation of the role of the Parliament in the assessment of science and technology. I follow the case of GMOs on a long time period in order to take stock of the changes in three related areas: -Evolution of the role of the Parliament in the assessment of technologies -Evolution of the role of OPECST in the Parliamentary work about technological issues -Evolution of the methodologies used to assess science and technology -with a specific scope on the place of uncertainty and the role of the publics This analysis leads to suggest that the way TA has been introduced in France is a case for weak institutionalisation.

OPECST remains a very weak actor in the field and consultation of publics -at once promoted with the 98 Citizens Conference on GMOs- remains quite exceptional.

Intermediary Arrangements for Reflexive TA: Politics and Craft.
John Grin, University of Amsterdam

Many contemporary, 'life-politics' (Giddens, 1991) type of problems require a reflexive type of technology assessment (TA) (Grin, 2004). Here, 'reflexive' denotes the self-critical and self-conscious reﬂection on existing development processes, as well as the structures that reproduce them. Such 'reflexive design' is to bring about linkages between innovative practices and processes of structural change. In earlier work, I have argued reflexive design may be seen as a third generation of TA, following what Smits et al. (1995) called 'watch dog' TA and 'tracker dog' TA. To underline of its inherent strategic orientation, I proposed to call this 'Puss in the Boots' TA. (Grin, 2009). This strategic orientation, and its position in between innovative practices and structural change, essentially implies that reflexive design is best located in intermediary arrangements. Such arrangements may both have relatively large degrees of freedom of the institutions of state, market, civil society and science, needed to nurture some reflexivity; and be able reach out to these institutions in order to promote structural change. Yet, precisely this duality of freedom and involvement will not be a priori given, but must be achieved in a process that involves powering and legitimizing. In this paper, we will explore how different arrangements may deal with that challenge. As a framework, I will combine the functions approach proposed by Jacobson as operationalized by Smits & Kuhlman (2004) and Hekkert et al. (2007) for understanding this type of intermediary arrangements with frameworks to understand powering and legitimizing that I developed earlier. I will compare several intermediary arrangements, which differ from each other in degree of freedom of and access to the surrounding institutional landscape *The Rathenau Institute, formally an advisory body operating at arms length distance of the Dutch parliament, not tied to particular domain; *The Innovationnetwork Green Space and Agrocluster, formally a change agent organization at arms length distance from the Ministry of Agriculture, and focusing on the domain of agriculture and rural planning; *An ad hoc arrangement for reflexive design within the care domain.

Chair:
Tatsujiro Suzuki, University of Tokyo

Discussant:
Jason Chilvers, University of East Anglia

Presenting Author:
Andrew Stirling, Sussex

224. Author Meets Critic: Warwick Anderson's "The Collectors of Lost Souls: Turning Kuru Scientists into Whitemen" (John Hopkins Prsee, 2008)
1:15 to 2:45 pm
5: 523

Chair:
Michelle Murphy, University of Toronto

Panel Members:
Kavita Philip, University of California, Irvine
Cori Hayden, University of California, Berkeley
Michael MJ Fischer, Massachusetts Institute of Technology
Warwick Anderson, University of Sydney

225. New Media Spaces, New Identities: Re-Conceptualizing Gender, Play, Intimacy and Sociality in Contemporary Asia
1:15 to 2:45 pm
5: 531

This panel aims at examining the diversification of social life and the emergence of new forms of intimacy, identities and social relations in the public arena in East Asian societies today. Based mostly on rich ethnographic data, the topics of the panel offer new insights into understanding the increasing importance of the global media, communication technologies, popular culture, consumer capitalism and cosmopolitanism. The first paper explores the "fantastic" world of about maid cafes, a form of "entertainment dining" featuring staff members wearing costumes, performing characters and playing games to target fantasies drawn from anime, manga and video games, as sites of alternative or "imaginary intimacy" for many Japanese (though mostly male), and as a microcosm of the growing economic and social anxiety and disenfranchisement in the wider Japanese society. The second paper moves a step further to explore the growing influence of East Asia's "intimate economies" and commercialization of intimacy by examining the strategic production of desire (images of masculinities in contemporary Korean popular culture) which makes "imaginary intimacy" into realizable, and the constructive ways in which many female Japanese fans "consume" these affective products and services for negotiating new gendered identities and "re-sexing" the self. The third paper extends the second paper by analyzing one productive aspect of the consumption of affect and examining the growing popularity of the Korean language among middle-aged and older Japanese women, whose interests, motivations and uses represent significant shifts in the ways in which Korean language has historically been appreciated by Japanese, and a re-valuation of the Korean language as a form of "global capital." The fourth paper further focuses on the positive influences and growing importance of information and communication technologies - including the Internet, mobile phones, and video games - in the lives of socially withdrawn Japanese youths (known as hikikomori) by helping them develop constructive self-help networks and support groups. The final paper shifts towards Southeast Asia to examine the revival of the pangalay, a variety of centuries-old dances, among poor grassroots Muslim communities in the Southern Philippines, and the reinvention of this traditional practice, through use of locally produced digital music video and karaoke, and assimilated with rock music, breakdances, and Bollywood's stylistic dance acts, has extended its appeal to both the young and old, as well as to men and women. By examining how different people utilize various sites that are temporally and spatially situated beyond the primary sites of modernist sociality (the home, the school and the workplace environment), this panel scrutinizes individuals as desiring subjects and active agents in their pursuits of sexual, material, affective and political self-interests, as they seek to recreate meaningful social relations, connections and identities. More importantly, this panel demonstrates the growing importance of the global media, communication technologies and the commercial realm in an increasingly culturally diverse postindustrial Asia.

Participants:

Maid Cafes and the Structure of Intimacy in Neoliberal Japan.
Patrick Galbraith, University of Tokyo

This paper is about maid cafes, a form of "entertainment dining" featuring staff members wearing costumes, performing characters and playing games to target fantasies drawn from anime, manga and video games. This study argues that social interactions in these cafés - which experienced a boom in Japan in the mid-2000s - actually reflect broader shifts in the structure of intimacy in Japan since the 1990s. The maid café is an attempt to construct a coherent frame for social interactions against the backdrop of a neoliberal economy that erodes people's sense of belonging in groups at work and at home which used to structure identity and interactions. The maid café offers "two-dimensional" relationships, a simple affirmation and affect created and consumed in a bounded space. Like the "simulation games" that first inspired them, the maid café offers a simple interaction, which functions to affirm the customer. The scripted fantasy is disconnected from the realities of roles and responsibilities (or lack thereof). Both visitors and staff do not think about society or future as they invest, both economically and emotionally, in the maid performance. Far from being deviant, as many have thought, this behavior is not deviant, but rather a logical outcome of material conditions. It is also an indicator of wider issues confronting Japan today. I analyze these maid cafes as sites of alternative intimacy developing in tandem with economic and social anxiety and disenfranchisement, and the self as having lost an institutional frame and the intimacy of belonging. With less incentive to "polish" oneself into an ideal part of a social system, many young Japanese retreat into the private worlds of fantasy, affect and affirmation, or "imaginary intimacy." The maid café

can thus be seen as a microcosm of this shift, as a dysfunctional or "de-social" form of play that reinforces the alternative fantasy orientation of the alienated. Maid cafes offer them moe, a media-informed, privatized affect. This study is based on data from five years of participant observation in maid cafes in Tokyo's Akihabara district, where the majority of maid cafes are located, and from interviews with returning customers, women working as maids and owners of maid café.

Re-Sexing the Self through Popular Culture: Japanese Women Desiring Korean Masculinities in Contemporary Korean TV Dramas. *Swee Lin Ho, The Catholic University of Korea*

This paper analyzes the growing importance of East Asia's intimate economies by examining the production of desire in Korean TV dramas ('the Korean Wave') and the consumption of these affective goods and services by Japanese women. The production of desire, as Lisa Rofel (2007) has argued, indeed lies at the heart of global processes. South Korea is today a key driver of inter-Asian and global cultural flows, and the images generated by the country's media industry are mediated by divergent consumption practices in different localities. The popularity of Korean actors in Japan is promoted through goods and services largely aimed at creating new ideas about intimacy and intensifying the desires of fans not at the level of fantasy, but "packaged" to provide fans with relatively "easy access" to their "commodified" idols (Korean actors) and hence enable fans to "actualize" - so to speak - their desires and fantasies. As the discourses of my informants showed, many Japanese fans, especially middle-aged and older women - who are generally considered to be non-sexualized beings in Japanese society - are able to mobilize even such semi-illusions as new possibilities and opportunities to re-engage their emotions and desires and, in doing so, to negotiate new identities and senses of self-worth through "re-sexualizing" the self. Among the many questions that drive this research is how manufacturers of souvenirs, organizers of fan events, and managers who groom and 'market' Korean actors, interpret and fulfill the needs and desires of these fans? Also, why do the makings and re-makings of masculine images in Korean TV dramas have such a particularly strong appeal to a specific age and gender category of Japan's population? By analyzing the production and marketing processes, this research thus extends existing discussions by providing a fuller understanding of the "transnational dialogues" and commercial processes through, to borrow Koichi Iwabuchi's (2008) words, "popular culture connections." In doing so, this research thus also provides better insights into understanding the implications of the processes of production, distribution and consumption of popular culture have on discourses and practices of gender, intimacy, sexuality, culture and class relationships in postindustrial Asian societies. This study is based on extensive fieldwork in Japan (2002-7) and South Korea (2009-10), including personal interviews with Japanese women (fans), producers/directors, actors/actresses, entertainment companies and scriptwriters, as well as participant-observation of numerous events, fan activities and TV drama productions in Japan and South Korea. It also forms an important part of my longstanding interests in documenting how the increasing commercialization of intimacy and the rapidly expanding intimate economies in Asia are shaping understandings and formations of family and social relationships across various age, gender and economic categories.

Language as Cultural Capital: The Growing Popularity of Korean Language Among Native Japanese Speakers. *Jung Hwa Lee, Sogang University*

This paper examines the growing popularity of the Korean language among native Japanese speakers as reflecting an unprecedented shift in the relative cultural, economic and political positionings of Japan and South Korea. My preliminary observations show that there has been a significant increase in the number of native Japanese traveling to South Korea to learn Korean, especially among middle-aged and older women, thanks perhaps to the recent popularity of South Korea's popular cultural industries in Japan, which has helped raise a greater awareness of and interest in Korean culture in Japan. Until the 1970s, many Koreans were required to learn the Japanese language, which was the official language during Japan's colonization of Korea in 1910-1945. Japanese later became popular among many young Koreans who were attracted to Japanese popular culture - manga and anime - and among those who hoped to enhance their career prospects by becoming proficient in the language of the world's second-largest economy. However, the reverse - that is, the learning of Korean by native Japanese speakers - was very limited until about a decade ago, and carried out mostly by historians, diplomats and literary scholars. The recent increase in the number of native Japanese learners of Korean showed a more diverse profile, not only in terms of age and gender, but also motivations and uses. Their focus, which I hope to examine further during my doctoral studies in Japan, is not on the scholastic or practical, but mostly for leisure, self-improvements and personal fulfillment. The learning of a foreign language is often analyzed in terms of its potential economic benefit and value, and globalization is often interpreted as global flows of people, capital and cultural processes that are making the world more and more uniform through the influences of dominant economies, cultures and languages. Transnational processes within various regions of the world - that is, the diverse "micro" processes of globalization - are often overlooked or ignored, and non-European languages are also hardly perceived as worthwhile languages to add to one's curriculum vitae until recently. Among Asian languages, Japan's economic miracle during the 1980s generated unprecedented international interest in Japanese business, language, and culture - including popular culture. A decade later, it was China's turn to draw international interest in its economic expansion, cultural practices and language. More recently, South Korea, the much-forgotten nation sandwiched between these two Asian giants - the world's second and third-largest economies - though once referred to as one of Asia's five economic tigers, has quickly repositioned itself to become a major player in the global economy through its electronics and communications industries, as well as popular culture and entertainment industries. By exploring how Korean has too gradually become an important form of "global capital" for a growing number of individuals in East Asia, and the particular social contexts and uses of Korean by these individuals, this study thus hopes to offer better insights into understanding the changing conceptualizations of modernity and capital in an increasingly globalizing Asia.

Hikikomori and engagement with information and communication technologies: Are hikikomori really only living in 'virtual reality'? *Sachiko Horiguchi, Temple University*

The positive and negative impacts of recent developments of information and communication technologies - such as the internet, mobile phones, as well as video games - on the lives on young people in late modernity have attracted the attention of social scientists over the years. Hikikomori, a Japanese category referring to socially withdrawn youth who typically stay withdrawn at home without having friends, attending school or having jobs, have often been characterized as negatively affected by these recent developments. Hikikomori tend to be represented in the mass media - including manga and anime - as synonymous to otaku (nerds, geeks) and only living in online 'virtual reality' created and maintained by these information and communication technologies. The stereotypical representation of hikikomori has been a male individual seated on his own in front of a computer or TV, or playing video games all day. Based on such a stereotype, some commentators have suggested that the availability of 'virtual reality' created and maintained by information and communication technology is one of the causes of the 'rising number of hikikomori youth'. My long-term ethnographic research of hikikomori, however, has revealed that the ways in which hikikomori, who are perceived as lacking face-to-face communications, relate to computers, mobile phones, or video games are much more complex. While there are so-called hikikomori who may be seen as fitting in such a stereotype, there

are many others who do not necessarily have access to such communication technologies. This paper draws on my one-year-fieldwork conducted in hikikomori support organizations around the Tokyo area, and will show the variety of ways in which hikikomori tōjisha (those who call themselves hikikomori) experience or distance themselves from computers and/or mobile phones, as well as the ways in which the 'off-line' social networks of hikikomori tōjisha and/or families of hikikomori tōjisha intersect with online communities and communications. The first part of my paper will introduce the hikikomori category as it has been understood in contemporary Japan, and will discuss the stereotypical representations of hikikomori in relation to recent developments in media technologies. Secondly, I will give ethnographic accounts of the use/non-use of online/offline games, internet, and/or mobile phones in the context of hikikomori support organizations and hikikomori self-help groups, while partly reflecting on the narratives of individual experiences. By providing these ethnographic accounts which undermine the stereotypical association of hikikomori youth with information and communication technologies, I aim at highlighting the complexities with which individual youth in late modernity associate or dissociate with recently developed modes of communication. This paper, more broadly, will contribute to science and technology studies by offering ethnographic perspectives into human engagement with developments in science and technology.

Pop and Tradition: the emergence of digital-based grassroots media and the reinvigoration of a traditional dance in Southern Philippines. *Jose Jowel Canuday, University of Oxford*

Pop music has often been viewed as culprits in the demise of traditional artistic performances in non-Western societies but a contrary observation can be gleaned from poor grassroots Muslim communities in the Southern Philippines. Pop musical renditions actually kept the pangalay, a variety of centuries-old dances commonly performed in some Southeast Asian island communities, fantastically dynamic and relevantly in tune with the rhythm of everyday life. Drawing from an ethnographic fieldwork on local appropriation of electronic media technology among the ethnic communities known as the Tausug, Sama and Yakan, this paper examines the reinvention of the pangalay amidst rapid proliferation of locally produced digital music video and karaoke. Traditionally played with the acoustic beats from intricate sets of brass gongs, the pangalay performed in the communities today has been enriched by festive disco-rock sounds from synthesizers, sound blasters, equalizers, and amplifiers. As the music becomes more electrifying, some performers integrate funky steps, breakdance styles, and Bollywood's stylistic dance acts in ways that do not compromise the dexterous body movements marking the unique character of the pangalay. In fact, performances using brass instruments and older dance notations have become extremely rare - much more confined to museum events, touristic entertainment, school dance troupes, government and privately organized "schools of living traditions," and the memories of the melancholic. Key to the reinvigoration of the pangalay as a popular people's dance is the emergence of a grassroots media amidst widespread accessibility and availability of cheaper, unbranded computer technology, compact discs, and DVD players in a provincial communities. These sets of low-end media equipment created a condition for a new, homegrown system of media production and trading. This new form of media system meaningfully and effectively captured local tastes and cultural yearnings like the integration of pop musical pieces and the traditional pangalay. The pangalay production created by this new and uniquely local media, have drawn together children, teenagers, adults and the elderly into a common appreciation of the dance despite the vast generational variation of their musical tastes and exposure to modern media productions. Such phenomenon sustains the pangalay as the most significant featured performances in weddings, child dedications, and other forms of community and kindred celebrations. The observations taken from this grounded view of cultural production runs contrary to an assumption that the pangalay is fast vanishing due to Western media influences and Islamic religious prohibitions. Far from extinction, the pangalay is very much alive and contextually performed in meaningful day-to-day social events. In closing, this paper concludes with the argument that like an on-rushing tide, the penetrating influence of pop in local performances and media productions is indeed inevitable but local agents are not just passively accepting Western media and creative productions. Instead of being overwhelmed, local agents are actively making use of and constantly re-appropriating modern and globally popular performances and media to sustain and enrich an age-old local cultural heritage like the pangalay.

Non-Presenting Author:
David H. Slater, Sophia University

226. Gender and ICT/Climate change

1:15 to 2:45 pm
5: 532

Participants:

From Grass-roots to Blog-roots: Women's Health Activism on the Internet. *Chikako Takeshita, University of California, Riverside*

The Internet has moved grassroots women's health movement online, making it possible for women to share health-related information and experiences through personal blogs and forums set up around specific interests. Women who did not receive adequate medical advice or support regarding uncommon side effects of an intrauterine contraceptive called Mirena are turning to other women with similar complaints to gain validation for their embodied experiences. Blog entries reveal that many women who suffered distressing physical and mental symptoms without a known cause had felt very much alone and as if they had lost control their bodies. These women recovered a sense of embodied self upon reading the narratives of other Mirena users, who attribute their experiences of weight gain, fat buildup around the waist, bad acne, hair loss, low sex drive, bloated stomach, nausea, depression, breast enlargement, and "feeling pregnant" to the contraceptive method. A number of blogs recommend removing Mirena, which are sometimes expressed as "undoing" their technologically altered bodies and "returning" to their "normal self." Such narratives often provide moral support for the new bloggers, who state their determination to have their devices taken out as well. A community called S.O.M.E. (survivors of mirena effects) has also emerged aiming to raise awareness around the less known ill effects. This paper analyzes Mirena users' voluntary narratives posted on blog and forum Internet websites regarding their experience with the contraceptive method. It investigates the blog-roots women's health activism as a relatively new phenomenon that has inherited some of the key elements established during the grassroots women's health movement during the 1960s and 1970s. It illustrates how bloggers formulated an "embodied technosociality," or constructed a collective identity based on shared bodily experiences with a specific technology. I argue that the Internet-enabled technosociality facilitated the transformative embodied experiences of the bloggers, who regained a sense of bodily wholeness after their unexplainable illness was authenticated by the physiological effects the same contraceptive allegedly had on other women. This paper contributes to STS in three facets. It furthers our understanding of technologically mediated social movement, particularly in relationship to women's health. It explores the boundaries between technological and physical bodies in post-modern technoscientific lives. Finally, it considers cyberfeminism through the blog-roots women's health activism.

Gender and Computing in India. *Roli Varma, University of New Mexico*; *Deepak Kapur, University of New Mexico*

Feminist scholars in the West have argued that computer science (CS) field is masculine. The typical CS culture consists of a set of idealized male norms such as falling in love with computers

with the first exposure, being extraordinarily well-versed in the inner workings of computers, myopically being focused on them to the point of obsession, and being antisocial. These male norms circulate in everyday life projecting the male way as the only way to be and do CS, thus a deterrent to women. It is, therefore, no surprise that women are under-represented in CS in the United States. In contrast, women in India have been increasing their presence in CS since 1990. It is mostly because a CS degree offers new possibilities to them to become career-oriented professionals, attain an economic independent, gain prestige, secure financial rewards, and feel valued. This paper focuses on how the CS in India has been constructed as a woman-friendly field. The paper is based on in-depth interviews conducted with 60 female students pursuing undergraduate education in CS at four institutions of higher education in India in 2007-2008. It shows there is a greater diversity in understanding the relationship between gender and computing than proposed by feminist scholars in the West.

Gender Disparities in Productivity Over Time: Has the Diffusion of ICTs in Low Income Areas Made a Difference? *Paige Miller, University of Wisconsin, River Falls*

This paper examines gender differences in the scientific productivity of researchers employed in three low income areas along four main dimensions: educational attainment, family structure, localism, and access to information and communication technologies (ICT). Specifically, we test the notion that new information and communication technologies change the gendered nature of science in low income countries by providing women with means to circumvent constraints on their physical mobility. We focus on publication in foreign journals and presentations at international conferences, which have become the most highly valued indicators of productivity. This essay presents the first analysis of gender using true panel data on scientists in low income countries. Using 540 scientists in Ghana, Kenya, and Kerala (India) sampled across two periods, we examine the impact of gender and new ICTs on research output in three venues: 1) unpublished work and conference presentations, 2) bulletins and reports, 3) and publication productivity. Results indicate very few gender disparities in outcomes in either period of the study with one important exception. Men and women scientists are equally productive but for the international arena where significant gender differences remain over time in spite of increased access to ICTs. The use of technology and a greater investment in human capital both emerge as important and fairly consistent predictors of research output but for men only. Female researchers have not yet been able to transform such investments into increased output.

Whose Benefits? Which Costs? How Climate Change Research Could Benefit from Feminist Research Principles. *Kristen Intemann, Montana State University*

Climate change impact studies have historically attempted to measure consequences of increases in CO2 equivalents in the atmosphere and provide cost/benefit analyses of possible mitigation and adaptation strategies to global warming. Such cost/benefit analyses have been criticized on several grounds. Some have questioned the extent to which some outcomes can be quantified (such as losses of life or health) or weighed against each other (Schnieder 2002; Graves 2007). Others have argued that current climate impact models disadvantage developing countries or reinforce systems of oppression. For example, recent models have neglected costs potentially salient to those in the South, such as the loss of cultural traditions and increased dependence on developing countries (Schnieder et al. 2000; Argawal 2002). Moreover, most models measure only aggregate costs and benefits of particular outcomes and fail to examine their distribution (Schneider et al. 2000; Shrader-Frechette 2005). As a result, they provide no way to distinguish between policies that distribute costs equitably from those that increase overall net utility at the expense of those who are the least well off (and arguably the least responsible for climate change). Several feminist science studies scholars have developed and defended a variety of recommendations for promoting more socially just science while increasing scientific objectivity. The aim is to structure scientific communities in ways that encourage the critical evaluation of background assumptions, theories, and models (including those that are sexist, racist, or Eurocentric) while producing research that challenges, rather than reinforces or ignores, oppression. In particular, several have argued that scientific communities ought to: 1) include researchers with diverse experiences, social positions, interests, and values who have equal authority and opportunity to criticize assumptions, methods, and models (Longino 1990; Nelson 1990; Longino 2002; Rolin 2006; Anderson 2006; Solomon 2006), 2) investigate scientific phenomena from the perspectives, interests, and conditions of marginalized stakeholders potentially affected by the research (Harding 1991; Harding 2004; Harding 2008; Kourany 2003), 3) make gender, ethnicity, class, and geographical location "visible," or use them as categories of analysis when appropriate (Longino 1996; Wylie and Nelson 2007, Harding 2008) and 4) encourage and produce a plurality of models and theoretical frameworks for understanding scientific phenomena (Solomon 2001; Longino 2002). Yet, more work is needed to determine what exactly these recommendations would require and the benefits they would yield in specific research contexts. The purpose of this presentation is two-fold. First, to show that climate change research could substantially benefit from incorporating feminist research principles. I will demonstrate that many of the problems with current climate impacts models could be better managed if research were guided by the four principles outlined above. Second, this presentation will illustrate how exactly feminist research principles apply and what they would require in specific research contexts. Showing how each of the four principles work in the context of climate research will be used to enhance our understanding of them and how they might apply more generally.

'I have to show an "I can" attitude '. *Caroline Victoria Wamala, Luleå University of Technology*

Intentional Missed calling referred to as beeping through the mobile phone, is a phenomenon that has taken the African continent by storm. Giving specific attention to relational beeps, this study analyses the practice through an intersectional theoretical lens, revealing a practice deeply imbued with social categorical orders. A year of ethnographic study in Uganda (2008) informed this study. Document analyses and twenty-three conversational interviews with friends, family and acquaintances with whom rapport had been established socio-culturally contextualised the rules associated with the practice prior to qualitative interviews with fifty three university students and recent graduates (20-28). Targeting young dating couples the focus on gender highlights complex rules to the practice that may deter some of the informants in this study from beeping. The same informants basing on other social relationships such as kinships can be found to engage in the same activity. Beeping is therefore a multilayered exercise that each individual at some socio-relational level engages in. It is the relationship to the beep recipient that negotiates this practice. The current study offers as a contribution to existing beeping analyses, an intersectional understanding of this practice. This study differs from previous beeping research, by analysing different gender-based negotiations that confront beeping practices. Mapping local, diverse expressions of masculinities and femininities at the intersection of beeping activities the study offers some recommendations on how Information Communication Technologies (ICT) in general can be useful signals of understanding sociological order.

227. The Social Study of Corporate Science (1)

1:15 to 2:45 pm

5: 533

Most scientists now work in for-profit organizations such as companies or consultancy firms. But the bulk of STS research and theory has thus far been based largely on studies of non-profit organizations, mostly academic

and government institutions such as universities and hospitals. STS scholars have examined the commercialization of nonprofit research institutions, as well as the relationships between industry, government and academia. But corporations and corporate science tend to be mentioned and hinted at, rather than studied in detail. When mentioned, corporate science has almost always been perceived as ruinously entangled with a world of power, profit and illusion. Steven Shapin has argued that from the 1920ies onward, Robert Merton and those who followed in his footsteps proclaimed that academic 'pure' science was the real thing. To Mertonians, scientists involved in for-profit enquiry were plainly morally inferior (Shapin 2008). Nowadays, the 'pure image' of academic science remains largely unchallenged: "commercial scientists are still stigmatized and academic snobbery still rules" (Ravetz 2009). STS has historically not addressed how corporate scientists' claims are constructed. In this session, rather than framing corporations as an incursion into academic institutions, we seek empirical studies of corporate science itself. We intend to address topics ranging from how corporate science differs from public science; how scientists collaborate within firms and across industries; how corporate science is situated and operates within firms and industries; and the unique methodological challenges of studying corporate settings. From these empirical contributions, we aim to distill possible roles for STS in for-profit settings and to aggregate arguments about how studies of corporate science challenge and inform STS' assumptions and theoretical tools. Ultimately, we also aim to reflect upon the usefulness of the demarcation between for-profit and non-profit inquiry. Ravetz, J. (2009). Morals and manners in modern science. Nature 457: 662-663. Shapin, S. (2008). The scientific life. A moral history of a late modern vocation. Chicago & London, The University of Chicago Press.

Participants:

The Quest for "Magnalux": Redefining Success and Failure in Corporate Science at RCA. *Benjamin Gross, Princeton University, Program in the History of Science*

While historians and sociologists have scrutinized both the resolution of scientific controversies and the construction of experimental truths within academic settings, the results of corporate research tend to be interpreted solely through the lens of profitability. Even as they acknowledge the artificiality of Cold War distinctions between pure and applied science, many STS scholars perpetuate the assumption that the success of an industrial project depends upon its ability to be transformed into a commercial product. Through an examination of RCA's early flat panel display research, I will demonstrate that economic concerns were only one of the criteria utilized to evaluate new technologies. In 1951, RCA chairman David Sarnoff publicly challenged his research staff to develop a "true amplifier of light" within the next five years. Although company scientists might have interpreted this request as a call to refine existing projection television systems for home use, an examination of internal research reports reveals that Sarnoff had a more ambitious agenda in mind: the replacement of bulky cathode ray tubes with "mural televisions" that could hang on the wall like a painting. Between 1951 and 1956, teams of chemists, physicists, and electrical engineers at RCA's Princeton laboratory devoted themselves to the task of making Sarnoff's "Magnalux" a reality. These efforts resulted in a pair of prototypes based upon electroluminescence, but significant technical obstacles remained before either could be adapted into a functional mural television. Prior to the 1956 deadline, RCA executives therefore had to decide which of two equally flawed light amplifiers to present to Sarnoff. This paper analyzes these deliberations, calling attention to each device's intrinsic shortcomings, RCA's financial situation during the early 1950s, and changing research priorities within the Princeton labs. It concludes that even in industrial settings definitions of experimental success remain malleable, contingent upon a broad range of factors only understood through the systematic investigation of corporate archives.

There is plenty of oil at the bottom: Frontier thinking in knowledge economy. *Birgitte Gorm Hansen, Copenhagen Business School*

This paper will neither celebrate nor criticize knowledge economy but simply ask what it can do. What kinds of knowledge claims can be made in a research project where science, industry and government interests are closely intertwined? Based on ethnographic fieldwork and interviews with scientists, the paper traces various representations of a research project on chalk. The chalk-project is situated in the interdisciplinary field of nano-geology and has gradually attracted more funding from the oil industry in spite of its basic science profile. The paper argues that this is done by a specific type of frontier-thinking which works to create a promissory space for future value creation. When viewed from the nano scale, the North Sea oil fields seem half full rather than half empty. There is plenty of oil at the bottom of the ocean if one knows how to look and future oil recovery might become analogous to milking a cow if one knows how to manipulate crystal formations. The paper demonstrates how the project manages to turn chalk crystals and calcite surfaces into a new frontier for oil recovery, while simultaneously transforming nano-geology into a frontier in itself - an untouched promissory space loaded with potential value. In this context, frontiers are not to be understood in terms of pre-existing territories or places awaiting discovery (Bush 1945). Inspired by the work of Anna Tsing, the frontier is neither a place nor a process but "an imaginative projects capable of molding both places and processes" (2005). Frontiers thus have to be created as wild untouched resources before they can be subjected to value-extraction. The paper uses this conception of the frontier along with ideas from the sociology of expectation to make an analogy between how scientists creates frontiers out of nature and how they themselves become frontiers in knowledge production; untouched resources awaiting extraction. The frontier is a "travelling theory" (Tsing 2005) whose logic seems to proliferate from the wilderness and into the heads of venture capitalists and science policy makers. However, there are important differences between making frontiers out of nature and out of scientists. The creative recalcitrance of scientists subjected to frontier thinking by the hand that feeds seem to challenge the conception that science is merely being engulfed by capital and government interest. Successful scientists attempt to use frontier thinking it in a way that allows them to receive resources without simultaneously becoming a resource for others. Tsing, A. L. (2005) Friction - An Ethnography of Global Connection, Princeton University Press, New Jersey Bush, V. (1945)"Science, the endless frontier", ACLS Humanities e-book

Safe ice cream innovation: The many safeties of ice structuring protein. *Bart Penders, Radboud University Nijmegen*

The notion of risk has been at the centre of attention in ELSA research for quite a while now. This paper, although closely related to discussions on risk, will take a different approach; not as a study of risk, but as a study of safety. While safety is much discussed in literature in general, the subset of ELSA literature has left it largely untouched until recently. What safety is, what it does, how it is made, unmade and managed, in complex or even contested (gene-)technological practices deserves (additional) attention from scholars, beyond the sole perspective of the study of risk. Since early 2008, I have been qualitatively studying R&D developments in Unilever. Based upon those studies, this paper will describe how a particular innovation, ice-structuring protein (ISP), was made safe. I will show that for the protein to become safe, it had to traverse multiple processes of safety construction, populated by various notions of safety. Strikingly, the GM component of the ISP production process has barely influenced the construction of toxicological safety, while it has had great ramifications for constructing economic and societal safety. The existence of parallel, or even conflicting, views on what safety is and how to reach it, represents a large variety - a rich resource for learning on individual and institution levels. This paper will stretch this argument to include a variety of epistemological perspectives towards safety. It will show that safety in fact consists of many safeties, complex characteristics co-constructed through the intricate interconnectedness of contemporary innovation pathways. Each safety has its own origins, its own epistemological and political ingredients and as a result its own history. Like the histories of countries on a single continent,

those histories are interwoven, interconnected and highly dependant, yet simultaneously they are conflicting and struggling for priority.

Chair:

Bart Penders, Radboud University Nijmegen

Discussant:

Sergio Sismondo, Queen's University

228. EASTS International Editorial Board Meeting

3:00 to 4:30 pm

5: 515

229. APSTSN Business Meeting

3:00 to 4:30 pm

5: 516

230. The Social Study of Corporate Science (2)

3:00 to 4:30 pm

5: 533

Most scientists now work in for-profit organizations such as companies or consultancy firms. But the bulk of STS research and theory has thus far been based largely on studies of non-profit organizations, mostly academic and government institutions such as universities and hospitals. STS scholars have examined the commercialization of nonprofit research institutions, as well as the relationships between industry, government and academia. But corporations and corporate science tend to be mentioned and hinted at, rather than studied in detail. When mentioned, corporate science has almost always been perceived as ruinously entangled with a world of power, profit and illusion. Steven Shapin has argued that from the 1920ies onward, Robert Merton and those who followed in his footsteps proclaimed that academic 'pure' science was the real thing. To Mertonians, scientists involved in for-profit enquiry were plainly morally inferior (Shapin 2008). Nowadays, the 'pure image' of academic science remains largely unchallenged: "commercial scientists are still stigmatized and academic snobbery still rules" (Ravetz 2009). STS has historically not addressed how corporate scientists' claims are constructed. In this session, rather than framing corporations as an incursion into academic institutions, we seek empirical studies of corporate science itself. We intend to address topics ranging from how corporate science differs from public science; how scientists collaborate within firms and across industries; how corporate science is situated and operates within firms and industries; and the unique methodological challenges of studying corporate settings. From these empirical contributions, we aim to distill possible roles for STS in for-profit settings and to aggregate arguments about how studies of corporate science challenge and inform STS' assumptions and theoretical tools. Ultimately, we also aim to reflect upon the usefulness of the demarcation between for-profit and non-profit inquiry. Ravetz, J. (2009). Morals and manners in modern science. Nature 457: 662-663. Shapin, S. (2008). The scientific life. A moral history of a late modern vocation. Chicago & London, The University of Chicago Press.

Participants:

Eli Lilly and the Routinization of Charisma. *Mark Peter Jones, University of Alabama - Huntsville*

In science policy and innovation literatures, academic science and industrial science are frequently defined in opposition to each other - as forms embodying contradictory organizing principles, logics, and values. Academic science is often characterized, in ideal typical terms, as 'open,' 'basic,' and 'curiosity-driven,' in contrast to 'private,' 'applied,' and 'directed' industrial research. In social studies of science, scholars investigating the increasing privatization and commercialization of academic research have lately questioned the validity of these renderings, from a number of different theoretical perspectives. Industrial research, however, has not been subjected to the same kind of empirical scrutiny, and misconceptions about it persist, even in social studies of science. I present an historical account of scientific work conducted in the biotech industry - a story about the disruption of research programs at a successful biotech start-up in San Diego, a company called Hybritech, following the acquisition of the firm by the pharmaceutical giant Eli Lilly in 1986. The research is based primarily on interviews with participants. The integration of corporate cultures was difficult for many of the involved parties, as is typical in mergers and acquisitions, and, in this instance, it led to an exodus of Hybritech's best scientific talent. The small firm's R&D programs went into a tailspin. Lilly purchased Hybritech in 1986 for more than $350 million. It unloaded the subsidiary in 1996 for less than $10 million. Prior to the sale, much of the technical work undertaken at Hybritech had been 'curiosity-driven.' When Lilly took over, the new management made attempts to 'rationalize' the small firm's R&D projects and to redirect its scientific teams, with catastrophic results. The failure of the merger subsequently became a business school case study - how not to grow a young biotech company. The story centers on a set of (interrelated) organizational challenges with which scientists and research managers in both academic and industrial settings must contend - how to coordinate the activities of persons and groups possessed of different skill sets, how to get experiments to work, and how to create and maintain organizational cultures that are conducive to creativity and production. This case suggests that, in terms of scientific practices and the conditions of scientific work, there may be as much variation within academic and industrial settings as there is between the two institutional sectors.

Interests and Corporate Disguises in Medical Science. *Sergio Sismondo, Queen's University*

Roughly 40% of the sizeable medical research and literature on recently approved drugs is ghost managed by the pharmaceutical industry and its agents. This amounts to thousands of articles per year — publication plans for a blockbuster drug (i.e. with annual sales of US $1 billion or more) can involve 80 to100 articles appearing in reputable medical journals over the course of a few years. This pharmaceutical industry research is almost all published under the names of academic scientists. Similarly, the industry hires academic scientists, termed 'Key Opinion Leaders' or 'KOLs' to serve as its speakers, and to deliver its continuing medical education courses. Clearly, the industry attempts to hide or disguise the interests behind its research and education. Such hiding of interests is not simply a routine promotion of the empiricist repertoire over the contingent one, as described by Gilbert and Mulkay. Instead, it is necessary because of a widespread skepticism about corporate science. The pharmaceutical industry assumes that readers of medical journal articles would assume bias, and possibly misrepresentation, if the full extent of corporate control over research and writing were known. Corporate funding and control do affect a myriad of legitimate choices in the design, implementation, analysis, description, and publication of clinical trials. There is abundant evidence, that the industry makes those choices to support its interests. The industry assumes that physicians and researchers understand that point when interests are made visible, but are otherwise more likely to treat medical seminars, education, and journal articles as straightforward reports of straightforward fact - however laden with choices it may be. The display of interests immediately creates an 'interest repertoire' in audiences' minds. This presentation explores the basis and justification of that interest repertoire.

Turning the Tables: Professional Identity Formation of Corporate Scientists. *Heng Alice Xu, Sloan School of Management; Massachusetts Institute of Technology*; *Fiona Murray, Sloan School of Management; Massachusetts Institute of Technology*

How do PhD scientists in corporations form and sustain their professional identity? For scholars in the traditional sociology of science, a scientist's professional identity is grounded in their training and subsequent work in academia. While academics represent an idealized identity, approximately one-third of U.S. science PhD graduates now work in commercial settings (NSF, 2008). Moreover, the private sector conducts and pays about 70% of all U.S. R&D including 20% of "basic research" (Shapin, 2008). Scholars have analyzed the boundary between academic and commercial science (Kleinman, 2003; Murray, forthcoming;

Owen-Smith et al., 2002). But surprisingly, the commercial side of the boundary remains poorly understood. In particular, how do corporate scientists maintain their professional identity once they have crossed the boundary? The question has largely evaded scholarly discussion except back in the 1960s (Kornhauser, 1962; Marcson, 1960). Yet much has since changed. Our findings draw from 37 in-depth interviews with 32 scientists at a leading biotech company, supplemented by observational data from a larger ethnographic study (2005-2006). We find that many scientists experience their career shift as a violation of common expectations. To handle the identity deviance, PhD scientists use two competing strategies. On the one hand, they turn the tables on academic science, formulating alternative interpretations about the differences and similarities between corporate and academic science. On the other hand, they ironically recreate a normative hierarchy between two types of corporate science using the old logic. The research people consider themselves "truer" scientists than those in development. We seek to make two contributions to the STS literature. First, an in-depth study of people doing commercial science addresses a recent and growing concern that the traditional STS focus on nonprofit science has missed the for-profit sector altogether (Penders et al., 2009; Shapin, 2008). Second, this study looks at how the scientists themselves deal with the difference between academic and corporate science, seeking to understand the much debated boundary from the native's point of view. Kleinman, D. L. (2003). Impure cultures: University biology and the world of commerce. Madison: University of Wisconsin Press. Kornhauser, W. (1962). Scientists in industry: Conflict and accommodation. Los Angeles: University of California Press. Marcson, S. (1960). The scientist in American industry. Princeton: Princeton University. Murray, F. (forthcoming). The oncomouse that roared: Hybrid exchange strategies as a source of productive tension at the boundary of overlapping institutions. American Journal of Sociology. NSF. (2008). Science and engineering indicators. Owen-Smith, J., Riccaboni, M., Pammolli, F., & Powell, W.W. (2002). A comparison of US and European university-industry relations in the life sciences. Management Science 48(1), 24-43. Penders, B., Verbakel, J., & Nelis, A. (2009). The social study of corporate science: A research manifesto. Bulletin of Science, Technology and Society, 29(6), 439-446. Shapin, S. (2008). The scientist in 2008. Seed Magazine, 19, 58-62.

In-corporating science: STS in the industrial laboratory. *Jane Bjørn Vedel, Copenhagen Business School*

Penders et al. have argued that STS should take a closer look at 'corporate science'. According to these authors, STS research has not previously paid enough attention to science in corporations but has instead focused on science made in 'publicly funded research institutions'. We would like to discuss this aim and encourage a discussion of the ways in which we can make productive STS inquiries in corporate settings. Along the way, we would like to suggest also that STS has a long-standing interest and involvement in 'corporate science' (as previous research by such authors as Lucy Suchman and Susan Leigh Star strongly suggests). What happens when we take a closer look at a 'corporate science' domain? To address this question we present a story from our fieldwork in a Danish pharmaceutical company, H. Lundbeck. Like many other pharmaceutical companies H. Lundbeck has, in recent years, become interested in developing platforms for future innovation based on new scientific discoveries. This has led to a variety of research collaborations with university researchers in which H. Lundbeck has experimented with different ways of getting access to potentially interesting ideas. One collaboration in particular caught our attention since it seemed most of all to be a Gordian knot. At the university - in the domain of 'publicly funded research' - H. Lundbeck were collaborating with a man who was at the same time a researcher employed at a university, the owner of a small biotech company and the director of a centre of excellence. At H. Lundbeck - in the domain of 'for-profit research' - there was a company being at the same time the safe keeper of intellectual property rights and the source of funding for basic research at the university. In this way, several practices were connected 'on both sides' and it was hard to discern what was public or private, science or product (or indeed where 'the sides' were). What are the implications of this case for discussing the research agenda of STS? We argue that it illustrates that the idea of a 'corporate science domain' is problematic from an STS point of view. As we know from early laboratory studies, things in public science labs move 'out of (and into) the lab' and connect to the outside world in multiple ways. Perhaps it is these networks that should be the object of our inquiry rather than the conventional demarcation between 'corporate' and 'public' science.

Discussant:

Benjamin Gross, Princeton University, Program in the History of Science