WEDNESDAY, AUGUST, 29

001. STS Journal Roundtables
Single Paper Submission
Special Event
9:00 to 11:30 am
ICC: Cockle Bay Room
** open to all conference participation / pre-registration encouraged to access supporting materials ** 4S's 2018 Infrastructure Prize Committee has been awarded to East Asian Science, Technology and Society: An International Journal (EASTS). The rapid development of EASTS into a journal with international distinction has resulted from both intellectual vision and organizational savvy. The session provides an opportunity to honor, learn from and leverage the EASTS example. In this prize session, editors of diverse STS journals will participate in a dialogue moderated by 4S President Kim Fortun, recognizing the formative influence these journals will have on the field of STS in coming years. Roundtable participants will be asked to share their goals for their journals, how these goals have changed in recent years, past and anticipated challenges, and how they are positioning themselves in initiatives to broaden open access both to journals and to the data behind journal publications. Dialogue will also explore ways diverse STS journals can work collectively and synergistically, sustaining distinctive styles and missions while moving together to conceptualize and build supporting infrastructure. We will discuss potential roles for 4S in supporting a rich ecology of STS journals, and how 4S should partner with initiatives like Libraria and ELPub, and with movements for open scholarship and a knowledge commons. The 2019 Infrastructure Prize Committee included Gloria Baigorrotegui (chair), Steve Jackson and Aadita Chaudhury.
Session Organizer:
　Kim Fortun, University of California Irvine

002. 4S Graduate Student Journal Working Group
Single Paper Submission
Rountable Workshop
11:30 to 1:00 pm
ICC: Cockle Bay Room
We invite interested graduate students and early career scholars to join us for an engaged discussion about the grounding formation of a 4S Graduate Journal. Following from conversations between students at 4S Boston, this meet up will provide an opportunity to brainstorm areas of focus for potential issues and to articulate roles and processes that are needed. Please contact Hined Rafeh at hinedr@gmail.com for further information.
Session Organizer:
　Hined A Rafeh, Rensselaer Polytechnic Institute

003. Making and Doing Sessions
Single Paper Submission
Special Event
1:45 to 3:30 pm
Museum of Applied Arts & Sciences: The Lab
Session Organizers:
　Teun Zuiderent-Jerak, Department of Thematic Studies - Technology and Social Change, Linköping University
　Michaela Spencer, Charles Darwin University

004. STS Across Regions: Honoring Diverse Scholarly Traditions
Single Paper Submission
Special Event
3:30 to 5:00 pm
ICC: Cockle Bay Room
STS has developed in different ways in different contexts around the world. In this session, leading figures from different geographic regions will share their experiences and perspectives. The session will extend engagement with the conference theme, "Transnational STS," and will complement the conference exhibition, "STS Across Borders." The session will be moderated by 4S President Kim Fortun. Panelists: Emma Kowal (Australia), Hebe Vessuri (Latin America), Liu Bing (China), Sharon Traweek (United States), and Leslie Green (South Africa).
Session Organizer:
　Kim Fortun, University of California Irvine
Chair:
　Kim Fortun, University of California Irvine

005. Welcome to Country and Presidential Plenary
Single Paper Submission
Plenary Session
5:15 to 6:45 pm
ICC: Cockle Bay Room
Presidential Plenary delivered by 4S President, Professor Kim Fortun
Participant:
　Presidential Plenary address *Kim Fortun, University of California Irvine*
Session Organizer:
　Kim Fortun, University of California Irvine

006. Welcome Reception
Single Paper Submission
Reception
7:00 to 8:30 pm
ICC: Cockle Bay Room
4S Sydney welcome reception featuring DJ Alexandra Lippman
Session Organizer:
　Kim Fortun, University of California Irvine

THURSDAY, AUGUST, 30

007. Experiments in Infrastructure I
Papers for Open Panels/Experiments in Infrastructure
Open Panel
9:00 to 10:30 am
ICC: C2.1

This session is about learning from infrastructure innovations, including, but not limited to, water, energy, and transport. The session papers will explore learning from 'smart' or innovative infrastructure experiments (variously termed trials, pilots, and demonstration projects), arising from environmental problems or other factors. Fitting with the conference theme of Transnational STS, we will be discussing issues regarding the role of power in infrastructure experiments, and considering new ways of collaborating across contested borders and boundaries to enable more just transitions. The session will address pertinent questions related to learning and infrastructure innovations: Who is learning what from infrastructure experiments, and with what outcomes? Where are these experiments emerging (geographical location, type of organization)? What is the effect of learning and knowledge exchange (in development of new standards, policies, etc) arising from experiments? Who leads infrastructure experiments, and who benefits? This session contributes to a growing area of interdisciplinary scholarship regarding the mobility of policy and knowledge about infrastructural experiments, and its relation to governance.

Participants:

Directionality in urban infrastructure experiments: Insights from the Resilient Melbourne Strategy. *Sebastian Fastenrath, University of Melbourne; Lars Coenen, The University of Melbourne; Brendan Gleeson, The University of Melbourne; Kathryn Davidson, The University of Melbourne*
There is a broad consensus around the urgent need for more resilient urban infrastructure to cope with chronic stresses and acute shocks in cities. Established principles and practices in urban policy and planning have been criticized for being inadequate in designing and delivering the infrastructure innovation required for resilient cities. Instead, collaborative experimentation is considered key in governing transition pathways to more resilient urban infrastructures (e.g. Bulkeley et al. 2011, Frantzeskaki et al. 2017). Here, experimental projects are supposed to destabilize and disrupt established structures and institutional logics of incumbent systems of urban infrastructure provision and to catalyse path-breaking infrastructure innovation. Such projects are driven by interactive learning between private, public and academic sectors brought together through global city networks such as the Rockefeller Foundation's '100 Resilient Cities'. On the other hand, scholars have labelled these network initiatives as 'philanthrocapitalism' and criticised their approaches for the neoliberal tendencies of prioritizing private sector agendas and skewing of public priorities (Acuto 2018). The Resilient Melbourne strategy, as part of the '100 Resilient Cities' network, initiated two experimental projects related to urban infrastructure in mobility (metropolitan cycling network) and urban greening (the metropolitan forest strategy). The paper critically investigates the directionality of these urban infrastructure experiments unpacking how different actor interests, resources and responsibilities have driven the outcome of these projects. In doing so it seeks to contribute to the recent call by Kivimaa et al. (2017) for more research on outcomes of transition experiments and, more specifically, how experiments can lead to more permanent institutional and material changes in urban infrastructure.

Engineering High-rise Living: An historical perspective on infrastructure experimentation and learning in Singapore (1960-1990) *Jane Margaret Jacobs, Yale-NUS College*
This paper approaches the theme of infrastructure experimentation and learning through an historical lens, using the example of the first 30 years (1960-1990)of modernist, high-rise housing provision in Singapore. This initial period of state-led experimentation in Singapore resulted in a radical reshaping of the housing infrastructure in the country, from attap "kampung" houses and shop houses to high-rise mass housing. Effectively, this period of rapid and radical housing change was a nation-wide infrastructure and social experiment. This paper focuses both on the mechanisms of internal feedback (e.g. social and engineer surveys, quality control mechanism) and international learning (e.g. study tours and commercial supply partnerships) that were established during this period. These mechanisms worked to align three important components of this large technological experiment: the emergent built infrastructure itself, the opinions of those it housed, and the specifications of component technologies (such as lifts). The paper draws on archival and oral history work with engineers and social scientists who worked in Singapore's Housing Development Board over this period.

Household energy storage revolution: Agents of change - the influence of intermediaries in catalysing transition. *Veryan Hann, University of Tasmania; Kate Crowley, University of Tasmania*
This paper argues intermediaries are central to the acceleration of an orderly STS transition of the electricity network in Australia — and that intermediaries may either catalyse and accelerate, or 'bottleneck' change. Internet-enabled residential batteries will likely be part of Australia's future hybridized grid, and this is being tested through a 35-household smart-battery pilot, known as CONSORT, funded by ARENA. The householders and three battery-system installers (as intermediaries) were interviewed about the implementation (installation) process. However, despite the appreciation of early successes from an engineering and computing point of view; the installation process itself was more fraught than expected from the householder, or social acceptance point of view. The surprising level of influence of intermediaries was observed through interview, as a form of flexible & ad-hoc problem-solving. For example, installers provided trusted knowledge and householder learning; 'quick-fixes,' 'non-scheduled experiments' or 'self-tests.' This influence — the increased agency; knowledge; experimentation; is customisation. This is argued to be a form of 'street level bureaucracy'(SLB) in policy terms. More widely, in viewing these findings through a governance lens, it is recommended to empower installers by actively learning from them in a formalised process, and to provide policy support in smoothly managing householders. This might include an online 'installer portal' so installers are not 'blind' to the householder battery-system operation in the way that the

network and software companies enjoy — these suggested solutions, to overcome a social and technical integration issues, are worth investigating as a stepping stone towards a smoother transition.

Innovation Districts - In Search for Backbones of Innovation
Jacek Gadecki, University of Science and Technology AGH; Karolina Anielska, National Institute of Spatial Policy and Housing; JU, Institute of Geography and Spatial Management; Ilona Morawska, National Institute of Spatial Policy and Housing; Lucas Afeltowicz, Institute of Sociology, Nicolaus Copernicus University, Toruń, Poland

Traditionally innovations were created in isolated facilities located in the suburbs. Nowadays, it is much more common that innovative companies localise their offices and workspaces in city centers in order to facilitate interactions between individuals from different companies and industries. Those areas are labeled 'innovation districts' (IDs). In our paper we want to focus on two issues: (1) Do successful IDs emerge naturally (bottom-up) or maybe they must be designed and "dictated" by city agencies (eg. urban planners)? (2) What kind of invisible human/nonhuman actors are responsible for facilitating and sustaining IDs? In our research we concentrate not on particular companies, but on their social and spatial environment which can be perceive as infrastructure for innovative processes. We analyse both social practices and elements of the architecture, localisation of creative companies, their direct proximity. Our paper is based on data gathered through multi-sited ethnography of infrastructure conducted in 3 Polish cities and complemented with data acquired with geographical information system (GIS) tools. In each city we study two areas: one naturally occurring ID (NOID) and one planned ID (PID). The presentation discusses results from first wave of longitudinal study (4 years) intended at monitoring fluctuations of particular IDs and mobility of particular workers and companies. In the paper we will present not at the 'core' of creative industries but on work of invisible agents sustaining the very existence of IDs. We are refereeing here to staff of technology parks, architects, officials, planners, facilitators, people renting offices, equipment, co-working spaces, event local businesses and cafes.

Session Organizers:
Heather Lovell, University of Tasmania, Australia
Andrew Harwood, University of Tasmania
Chair:
Heather Lovell, University of Tasmania, Australia

008. Research Infrastructures, Digital Tools and New Directions in STS Research
Papers for Open Panels/Research Infrastructures, Digital Tools and New Directions in STS Research
Open Panel
9:00 to 10:30 am
ICC: C2.2
Participants:

Building a Community History of Biotech in the Bay Area
Joseph Klett, Science History Institute
Biotechnology is forged through interconnected actors, ideas, and institutions. Many stories have been told from the field, but none that capture the complex exchange between bodies and materials that constitute a community. This paper presentation outlines a new research project on the emergent history of biotechnology in the San Francisco Bay Area. The Community History of Biotech project is an attempt to archive and map a relational system of narratives, artifacts, and information using digital tools that bring together members of this historic community with interested publics and rigorous scholarship. Elements of this digital platform will include collections of individual and collective oral histories, mediated discussion spaces that convene groups around narratives and material artifacts, research tools for scholars to track, visualize, and expand upon archival materials, and live events that curate interaction between community members and public audiences. Of course, any attempt to comprehend such vast empirical terrain cannot shy away from methodological concerns: the organizational, interpretive, and ethical dimensions of a living archive requires critical reflection and appropriate response. Our intention in making a community history of this scale is to invite our own community of scholars to engage the use of digital research platforms, to challenge the bounds of historical scholarship, and to reflect on new methods of analysis.

Data, Design and Democracy : Embedding the Ethics of Algorithms into Data Science Curriculum *Theresa Dirndorfer Anderson, University of Technology Sydney*
This paper shares accounts of ways data ethics and the politics of algorithms can be embedded in a transdisciplinary data science program to transform data practice. Critical data studies brings into the open a core message that data does not speak for itself, but rather, is given a voice by the people, algorithms and structures that play increasingly critical roles in the transformation of data into insight. Using a social informatics and STS perspective to shape curriculum sensitises students to the significance of the co-evolving relationship between people and data technologies for their work practices. To embed in our students an awareness of the consequences of choosing specific technologies for their practice, we examine the infrastructures within which those data practices unfold. Students engage at a theoretical level with questions of how and where data systems and classifications are produced alongside the practicalities of the data work they perform in real-life, project-based contexts. Their critical reflection on these socio-technical entanglements sheds light on the relations of power and invisibility and the implications of varying perceptions of visibility for their practice. The paper shares the conceptual framework, learning design that contributes to students' deep engagement with the background "shadow work" of their knowledge practices, and accounts from students' blogging about implications for their practice. Early experience with this approach suggests that such theoretical engagement has the potential to shape data science practice. By foregrounding critical data ethics considerations, students are inspired to become agents of change in their data practices.

How could research infrastructures better support transdisciplinary research *Yuanying Gao, National Academy of Innovation Strategy, China Association for Science and Technology, Beijing, Chin; Lili Qiao, National Academy of Innovation Strategy, China Association for Science and Technology, Beijing, Chin; Yuebao Di, National Academy of Innovation Strategy, CAST, China*
The construction and operation of large scale research

infrastructures can foster transdisciplinary research and recombinant science apparently, but few exiting studies cover this topic. This paper explores the transdisciplinary performance of large scale research infrastructures by using bibliometric measures and with a case study of a major research infrastructure in China- the Shanghai Synchrotron Radiation Facility(SSRF). The quantitative results display that the SSRF facility indeed stimulates and sustained the forming of hybrid fields at the intersection of traditional scientific disciplines, but a proper mechanism supporting is lacked. Finally, comparing with Diamond Light Source, we suggest some policy advices to catalyze transdisciplinary engagement in the process of using large scale research infrastructures. For STS, this paper is into Topic No.62 'Exploring Approaches to Catalyzing Transdisciplinary Engagement', and tries to answer the question of 'What critical infrastructure is necessary for transdisciplinary research'.

Ways of Seeing Memory, Database and the Narrative *Venkat Srinivasan, Archives, National Centre for Biological Sciences; Dinesh T B, Servelots Infotech Pvt Ltd; Bhanu Prakash, Servelots Infotech Pvt Ltd; Shalini A, Servelots Infotech Pvt Ltd*

Digital archives afford us the ability to see connections between memory, database and the narrative. Archival databases coexist with multiple narratives that emerge from the linking of primary records like oral history interviews and photographs, manuscripts and archival video footage. We propose the architecture for a digital archive with two parallel worlds: one, a dynamic annotation layer to allow for multiple interpretations of the data, and two, a storytelling portal that helps build narratives from raw data. We stress that the primary purpose of an archive is to enable a diversity of stories. All other functions – annotation, accession, preservation, tools – are in service of that aim. By building such an ecosystem, we also hope to bridge the gaps between four existing communities: the scientists, historians of science, storytellers for a non academic audience, and the public. As a start, we built a pilot project on thirteen ways to reflect upon and assemble the history of a Bangalore-based research institution (the exhibit title pays homage to Wallace Stevens' poem, Thirteen Ways of Looking at a Blackbird). In the next phases, we will release an open source template that is the foundation for an interconnected digital archive of science: a pilot network of archives and metadata from five science archives in India. Note: This abstract is an edited and updated version of previous presentations of this project.

Session Organizers:
Lindsay Poirier, Rensselaer Polytechnic Institute
Bradley Fidler, Stevens Institute of Technology

009. Us and Them: Sociotechnologies of Alterity/Otherness
Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: C2.3
The prefix trans, observes Aihwa Ong, denotes "moving through space or across lines, as well as changing the nature of something" (Flexible Citizenship 1999, 4). Transformative research in STS and kindred fields has both deepened, and problematized, our understanding of borders and boundaries as lines mobilized in and through particular enactments of inside and outside, similarity and difference. This panel builds on the generative possibilities of STS scholarship to examine sociotechnical infrastructures that materialize delineations of difference within human and more than human worlds, as a way of elucidating both the changeable nature of things (individuals, collectives, institutions, polities) and the arrangements that hold them in place. A central concern is not only the spatialities but also the temporalities through which difference is made, including those between incorporation and alienation, us and them. STS conceptions of multiplicity are a rich starting place for this project. In their reflection on the performative effects of categorization, feminist economists J. K. Gibson-Graham observe that "If there is no singular figure, there can be no singular other" (1996, 15). Articulating the multiplicity of figures, not only in terms of differences between but also those within a category, is a step towards loosening the grip of injurious orderings. The papers in this session engage the session theme across a multiplicity of sites, including temporal un/doings of planetary politics, language and representation in governance, technologies of registration and border-making, counter imaginaries and practices of future making, and material semiotics of Othering in technologies of military training.

Participants:

Alterity and Temporality *Karen Barad, University Of California At Santa Cruz*

According to the Bulletin of Atomic Scientists' Doomsday Clock we're now back at 2 minutes to midnight, the closest the clock has ever been to the time of the apocalypse. What does it mean to return to this time after so much time has lapsed? If nuclearity in its disorienting effects interrupts pre-Cold War confidence in determinate temporal and spatial orientation, as Joe Masco brilliantly details in Nuclear Borderlands, have clocks not run their course of usefulness, perhaps most poignantly symbolized by the permanent inscription of 8:15 melted into the faces of clocks and watches by the bombing of Hiroshima? Given that quantum physics was instrumental in producing the bomb, this paper takes up the question of whether militarism, racism, imperialism, and colonialism can be located inside the very terms of the theory, and whether there also exists possibilities for imagining their undoings, not by some reversal of/in time, but rather the dis/orienting effects of temporal un/doings.

'Us' as 'Us and Them Here and Now': Language as Sociotechnology in Parliaments *Michael Christie, Northern Institute, Charles Darwin University; Helen Verran, Charles Darwin University, Casurina, NT*

There is a knotty problem getting in the way of the smooth workings of the current Northern Territory parliament, 'The Northern Territory Legislative Assembly' in Northern Australia. In November 2016 Mr Yiŋiya Mark Guyula gave notice of a motion proposing reform to Standing Order 23A (Speaking of Languages other than English during proceedings of the Legislative Assembly of the Northern Territory). Mr Guyula is a Yolŋu Aboriginal man and is the parliamentary representative of an electorate in which some form of Yolŋu matha is the first language for most electors. Various forms of Yolnglish along with much 'code switching' constitute the lingua franca of every day life in Arnhemland. In order to do his work as a parliamentary representative Mr Guyula is insistent that in addressing the legislative assembly he needs to speak his own Yolŋu language –Djambarrpuyŋu, followed immediately by speech in English. Only in this way can he truly re-

present his constituents' interests to the state. This paper goes back to the early work of Shapin and Schaffer in STS, to re-consider language as a sociotechnology in the workings of parliaments.

Processing Alterity, Enacting Polities *Annalisa Pelizza, University of Twente*

This paper introduces data infrastructures for alterity processing as a field of inquiry for Science and Technology Studies, concerned with the infrastructural construction of polities. Drawing on fieldwork conducted at Hotspots involved in registration and identification (R&I) procedures on the Northern side of the Mediterranean Sea, it suggests that institutional practices, (meta)data and procedures designed to translate unknown people into European-readable identities co-produce migrant people and polities. On one hand, what get materialized at each disembarkation on European docks are attempts to establish order by creating (non)population registers. The first case focuses on bracelet-coding as analogue metadata. Despite its apparent simplicity, NGOs bracelet coding is a sophisticated system that translates a chain of violence and vulnerability into an artefact, while at the same time preserving privacy and excluding unauthorized observers. This case shows that procedural choices on how health conditions and vulnerability are coded into data and rendered readable through metadata co-produce migrants and Europe in different ways. The second case discusses how non-European people on the move towards Europe normatively redefine the meaning of European citizenship in their interaction with R&I procedures. Migrants and refugees enact themselves as political subjects by doing what they are not supposed to do: to make claims on what European citizenship should be. They do so not by mere speech acts, but when filling forms, providing answers to be entered in databases, refusing to take X-rays to establish age. By so doing, refugees and migrants enact an interstice in which they become subjects and not mere objects.

Hacking Digital Universalism: Ritual, Memory and Enacting Technocultural Futures in the Andes *Anita Say Chan, University of Illinois, Urbana-Champaign*

Channeling the promise of unbounded global interconnection, and projected as the key to optimizing individual and system-wide productivities alike, networked digital technologies have been conjured as the contemporary's obligatory passage point for entry into a universal path to the technological future. The colonial and chronopolitical underpinnings that mobilize digitality's spread as the mark, measure and tempo of development, particularly in the Global South, however, have been met with mobilizations of imaginaries for distinct digital cultures and forms of global connection that emerge and extend beyond urban centers of technological innovation. This paper will attend to the entanglements of and experiments in techno-cultural collaboration from rural hack lab spaces in Peru, which distinctly engage materialities of nature, technology, and information to disrupt the dominant logics of digital universalism. By fostering collaborations between diversely situated actors – bridging Latin American technocultural activists, transnational media producers and Andean indigenous communities – such networks press a cosmopolitcal urging to think together "with the

unknown," (Stengers 2010 Cosmopolitics I,76) and explore alternative collective futures through an interfacing with multiple local pasts.

Apparatuses of Recognition *Lucy Suchman, Lancaster University*

Central to the various promissory trajectories of contemporary research and development in military technologies are means for the imaginative occupation of geographies that comprise the United States' theaters of operation (see Masco 2014). In the domain of military training, this promise configures itself as the design and deployment of simulated environments for the honing of relevant aspects of what military discourse terms 'situational understanding' (Dostal 2001). The disintegration of the marked/uniformed body that signals the difference between 'us' and 'them' in the U.S. military imagination has engendered an intensified preoccupation with reading difference, evident among other places in new pedagogies of training in 'cultural awareness.' This paper is in conversation with ongoing anthropological critique of this cultural turn (Network of Concerned Anthropologists 2009), diffracted through the material semiotics of a particular technology. More specifically, I read documentation of the Cultural and Cognitive Combat Immersive Trainer (C3IT), a demonstration virtual training site for culturally aware interrogation, developed at the Institute for Creative Technologies in Southern California in 2006, against research on so-called 'live' exercises carried out in the American desert (Stone 2017) and developments, particularly in Iraq, during the same period as they were rendered through other accounts. The point of this reading is less to determine greater and lesser accuracy in depictions of a singular reality, than to compare how military training technologies aspire to recognition of the proxy bodies of war's Others, both corporeal and virtual.

Session Organizer:
Lucy Suchman, Lancaster University

010. STS Africa: Information Technology

Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: C2.4

This Panel seeks to explore the question "What are the boundaries of Science and Technology in Africa and how should we recognize and address both the uniqueness of African knowledge production and innovation on the one hand, and the potential that STS work in Africa has to offer to the field as a whole on the other?" We hope to answer these questions by working across the three domains of information technology, medicine, and the environment as they relate to Africa. We seek submissions of abstracts in the following three areas: Information Technology – In contemporary Africa, the music of modernity is the ring of the mobile phone. An Information Technology revolution has swept the continent especially with the adoption of the mobile phone, and in later years, the mobile internet. Multiple African STS scholars have examined the mobile phone as a particular information technology that is co-constituted with Africa (de Bruijn, Nyamnjoh, and Brinkman 2009; Zegeye and Muponde 2012, Odumosu 2017). For example, de Bruji, Nyamnjoh, and Brinkman examine emergent innovations and new practices around mobile telephony such as healing practices (van Beek 2009), engineering design (Odumosu 2017) and mobile money platforms (Donovan 2012). Biomedicine – Similarly, much STS of Biomedicine in Africa has been in

dialogue with Critical Global Health. Clinical trials have been a particularly important site for consideration of power and knowledge (Crane 2013, Kelly and Geissler 2012). In both the study of pharmaceuticals and the study of toxicology, Africa has also been part of the broader interrogation in STS of the tension in science between its claims to universality and its practice in particular places, because lab-based biosciences are figured as the most placeless and prestigious, and African scientists have challenged their exclusion (Okeke 2011, Pollock 2014, Tousignant 2013). There has been important work challenging the figuration of Africa as lack (Mkhwanazi 2016). Environment / Critical Studies of Infrastructure – The Environment is also central to how Africa is invoked. Africa is often used as a symbol of wildness on the one hand and underdevelopment on the other, and there is considerable scholarship of the intersections nature and development there (Walley 2004) that has much to offer STS more broadly. There has already been productive cross-talk between the spheres of Biomedicine and Environment. This is partly because of the way that, for colonial science, understanding the natural world in Africa was intertwined with other imperial projects including extracting natural resources of potential benefit to health (Tilley 2011). In the disparate spheres of bioprospecting and natural therapies on the one hand (Osseo-Asare 2014, Droney 2016, Foster 2017) and mosquito control on the other (Kelly and Biesel 2011), nature and medicine necessarily come together.

Participants:

Concurrent Mobile Telephone Concepts and Web Information Infrastructure and Digital Tools by Illiterate Yoruba Peoples in Benin Republic: Production of Knowledge for Communication and Learning *Aimé Dafon Segla, Université d'Abomey-Calavi*

The mobile telephone and web infrastructure contributes to the personal development of the individual and his or her capacity to evolve initiatives for economic growth and development. Yet, foreign languages remain the primary means of expression in which mobile phones and web infrastructures are configured in Black Africa today. Furthermore, the basic functions of text messaging, internet web 2.0, e-commerce, media and web communication, etc, are underutilized, and only the 'call' function is used by those who are non-literate in foreign languages. However, even in these poor conditions of under-utilization and handicap, the local people innovate by creating procedural knowledge in order to communicate. This study was based on interviews with approximately fifty people, who were primarily women and men traders or, are peasants, art craft men, etc., in the markets and places of work in Central Benin, and who speak Yoruba. The ethnographic research focused on the production of knowledge and concepts for the utilization of the mobile phone and adapted web infrastructure like facebook or whatsapp in the mother tongue. Based on these on-site creations, mobile application software (mobile app) that is capable of contributing additional value and facilitating the training and education of the local people is envisaged. The mobile app, 'Mobile - Je m'éduque', is intended to teach those who are non-literate in foreign languages how to read and write in the mother tongue using Vygotsky approaches revisiting Piaget. In addition to allowing for the utilization of the entire functioning of the mobile phone, this can facilitate the development of indigenous languages as a basis for diffusing new technologies, as well as for innovation. Key words: communication: mobile penetration; application:

mother tongue; education: training-africa; knowledge production; epistemology: culture-technology-innovation; concept: history-culture-logic.

Mobile and Social Networks *Wesley Shrum, Louisiana State University; Paige Miller, University of Wisconsin, River Falls*

How has the introduction of mobile affected social networks? The two primary theories of network change focus on boundary solidarity, which predicts contraction, and the strengthening of weak ties, which predicts expansion. We have examined the diffusion of mobile technology at repeated intervals from their introduction until their virtually complete saturation in many sub-Saharan countries. This presentation reviews original data from Kenya and Ghana, with data on south India for comparative purposes.

New meditations on something old: Paper as information and communications technology *Crystal Biruk, Oberlin College*

In 2017, MSM-identified peer educators affiliated with Malawi's only LGBTI-rights NGO gathered around forms they would use to record details about encounters with fellow MSM in the field: name, age, number of lubricants and condoms distributed, and whether individuals were referred to a district hospital for STI-testing. Peer educators receive small monthly incentives if they 'reach' a quota of new MSM. One anxiously inquired what this bottom line number was, while others mumbled incredulously, "How many of us [MSM] do they think there are?" This scene reflects the rising importance of recruiting "key populations" into Malawi's AIDS response. Despite homophobia, the Global Fund's largest allocation of funds to any country ever to Malawi in 2015—conditional on LGBTI prioritization—means government relies on the NGO to enlist MSM into HIV programming. This paper stages an ethnographic reading of paper documents' social lives, tracing inscriptions that embody relations between elements in scientific infrastructures: the field, the office, reports, databases, indicators, funders, and policy. I will argue that paper, including referral forms, respondent driven sampling tickets, encounter forms, MOUs, and monthly reports, is a key technology through which global interests are translated into and cohere social worlds. Amid scholars' growing attention to digital technology, mobile phones, and technological innovation in Africa, I present a humbler rendition of "information technology." Paper, I argue, is a mundane but fruitful starting point for building STS theory and method from the South, whereby 'old-fashioned' documentary practices reveal innovative ways of managing uncertainty, meaning-making, knowing, and creating.

Modelling modernity and how it plays in the market: Commercialising ICTs in Nairobi *Michel Wahome, University of Edinburgh; Matthew Harsh, Cal Poly; G. Pascal Zachary, Arizona State University*

Digital technologies were expected by their advocates to flatten global asymmetries of knowledge, information and economic development. ICTs can be re-engineered, repaired, designed and used by a diversity of actors who hold a variety of knowledges and skill sets, derived from formal and informal sources. This attribute provides a broad opportunity for locales to generate situated modalities of use and innovation. Despite this potential, the persistent framing of some places as non-modern and

their aspiration to modernity means that in Nairobi, and elsewhere, the language of the digital economy is best spoken by 'cosmopolitans' well-versed in supposedly 'universal', but mostly Western modalities. The identities, narratives, practices, institutions that replicate the 'tech start up' imaginary thus reproduce age-old asymmetries. Local arenas however, resist mischaracterisation, represented in outcomes such as 'low uptake', 'no markets' and other indicators that technologies are not locally apt. This paper analyses how actors reinforce the validity of 'tech start-up ecosystem' tropes through the knowledges and practices to which they attribute success, versus those that they need to commercialise technologies locally. This contributes to STS scholarship interested in analysing African technoscience in situ, "between…locally generated and inbound ideas, instruments, and practices." (Mavhunga, 2017: 9).

Session Organizers:
Toluwalogo Odumosu, University of Virginia
Anne Pollock, Georgia Tech

Discussant:
Toluwalogo Odumosu, University of Virginia

011. Environmental Visualizations: Connecting Images, Knowledge, and Politics I
Papers for Open Panels/Environmental Visualizations: Connecting Images, Knowledge, and Politics
Open Panel
9:00 to 10:30 am
ICC: C2.5

We welcome papers that explore the creation, design, use, and societal politics of visualizations in the environmental context. Visualizations are images or representations that communicate information in accessible formats to specific audiences. In 1990, Woolgar and Lynch published Representation in Scientific Practice, which examined the use of diagrams, drawings, and graphs to depict scientific data. This work has been updated (e.g. Pauwels 2005; Coopmans, Vertesi, Lynch, and Woolgar 2014) to include medical imaging, economics graphing, and other applications. However, relatively little work has concentrated on visualizations of environmental and social issues, their production and character, and their role in civil society discourses, government policy-making, and industry practices. Over the past 30 years, visualizations have become influential artifacts in reshaping both public knowledge and citizen agency. Increasingly, visualizations are designed to be interactive and to convey narratives. This panel will look critically at the nature and politics of visualizations as ways to know and learn about environmental matters. A key area of interest is to compare visualizations and interpretive conventions across diverse cultural and national settings, especially in the Asian region. Examples of potential topics include the rise in participatory mapping of air pollution in urban areas, the graphical representations of biomonitoring data, the use of GIS to track environmental hazards, and the real-time coverage of wildfires. Visualizations also play a central role in climate change science and politics—such as mapping droughts, sea level rise risks, and changing disease ranges. Visualizations can connect land use, health, ecosystems, and industry in novel ways.

Participants:
Corporate environmentalism and the making and visualization of environmental knowledge *Louise Karlskov Skyggebjerg, Technical University of Denmark: History of Technology Division DTU*

In the wake of the Brundtland report 1987, corporate environmentalism became a hot topic among industrial managers. Environmentally friendly behaviour became something to be measured, visualized and circulated as knowledge. Something to be represented for stakeholders as an important part of industry practices. But how? One of the solutions was the creation of green accounts including the use of Life Cycle Assessments (LCA), a tool developed as a way to measure and visualize the environmental aspects of a product from cradle to grave. Sometimes industry practices were changed to be more environmentally friendly. Sometimes not, only the linguistic and visual representation of the practices, which led to discussions about "green-washing". In the paper, the making of environmental knowledge in Danish triple helix constellations in the 1990s is analysed. The aim is, through the empirical case, to look at how exactly environmentally friendly behaviour was created as a relevant topic for the industry, and how this behaviour was translated into something, which could be represented on paper as text, numbers, standards, diagrams and ecolabels in green accounts and the like. This translation included among other things the creation and use of complex databases and software, which can be analysed as an example of post-normal science including high degrees of uncertainty and value conflicts. Using STS concepts such as translation, representation and mediation, the black box we call sustainability, an important part of corporate communication, will be analysed as something constructed historically.

Public deliberation on water: The case of Uruguay *Marila Lázaro; Isabel Bortagaray, Universidad de la Republica*

This paper is about a process of public deliberation (Deci Agua) on the national water plan held in Uruguay in 2016. The intrdocution briefly sketches the national context on water policy, the elaboration of the national water plan and this deliberation process in particular, which aimed at analyzing and revising a draft of the national water plan by a panel of 15 citizens in close relationship with an advisory group and a coordination team during three months, from October to December 2016. The focus of the paper is on the deliberation process, the policy impact of the Uruguayan public deliberation process and the extent to which the public panel's report was taken into account for the national water plan, and the internal and external legitimacy of the process. Finally, the conclusions relate to the evaluation of the deliberative process in relation to the foundations of deliberative democracy.

Geospatial Data, Citizen Science and Social Participation *Sarita Albagli, IBICT Brazilian Institute for Information in Science and Technology; Allan Iwama, Post-Graudate Program in Information Science/IBICT-UFRJ; Henrique Parra, Unifesp - Federal University of Sao Paulo; Hesley Py, Post-Graudate Program in Information Science/IBICT-UFRJ*

The paper discusses the role of co-production and sharing of geospatial data and its visualization as maps, as a modality of citizen science with the potential to amplify social participation in territorial planning and development policies. It is part of the results of an action-research project in the municipality of Ubatuba, on the Northern coast of the State of São Paulo, Brazil, supported by the OCSDNet/IDRC. The study involved: a review of the literature on the role of data visualization

(specially maps) for social appropriation of information and influence in policy-making; the monitoring and documentation of public consultation and debates on local processes of reviewing the ecological-economic zoning (EEZ); and the development of an experiment of participatory data visualization with local actors throughout this process. Public hearings on EEZ have not been sufficient to neither inform local communities nor to empower them to intervene in this process, affecting the quality - and hence on the scope - of their claims. It was conducted an exercise to build a platform prototype that articulates the efforts of sharing and visualizing spatial data, in an open and collaborative way. This experiment allowed: (1) to exchange experiences and needs among different groups and institutions; (2) to collectively construct protocols on priority topics; and (3) to stimulate synergy among future initiatives of common interest. The study points out the dual character of maps as technical and political tools under dispute that potentially both strengthen hegemonic actors and empower the vulnerable ones.

The Periphery on the Map? USA's Air pollution Mapping and Analysis Program in South Korea *joohui kim, Seoul National University*

This paper examines how the 'BenMAP(Environmental Benefits Mapping and Analysis Program),' free and open-source software developed by U.S. EPA, both shapes and is shaped by atmospheric pollution policies and research in South Korea. BenMAP is originally designed to estimate the health impacts and economic value resulting from changes in air quality, and provide scientific basis for the management of air quality in USA. EPA constantly promotes BenMAP to policymakers and researchers in other countries as well, which enables its users to visualize air pollution and resulting benefits with just a few clicks. South Korean government and scholars, who have been urged to cope with the worsening air pollution, have been developing and utilizing 'Korean-Style' Ben MAP with the help of EPA since 2003. This paper investigates how BenMAP technology itself is reconstructed into Korean-Style one, how this newly adapted technology affects research and policies in practice, and what the implications of using American technology in Korea are, considering center/periphery power dynamics. In the first part of the paper, it traces the social construction of imported technology by focusing on the Korean researchers' tweaking efforts to make 'Korean-Style' BenMAP. Secondly, this paper analyzes how Korean-Style BenMAP actually facilitates or confines air pollution research and policy evaluations in Korea. Thirdly, by paying attention to the EPA's steady efforts to disseminate its program in Korea, this paper aims to show the politics of mapping and analysis program, revealing the power dynamics between the center and the periphery.

Session Organizer:
Alastair Iles, UC Berkeley

012. Global STS in Deglobalization of the World
Papers for Open Panels/Global STS in Deglobalization of the World
Open Panel
9:00 to 10:30 am
ICC: C2.6
The proliferation of STS as a scholarship outside Euro-American

spheres has gradually changed not only the structure of STS institutions and networks, but also brought implications on the epistemology of STS as an transdisciplinary field. As more contributions are made by non-EuroAmerican STS scholars to the field, the contents and concepts of STS are becoming more diverse, both empirically and theoretically. Thus, a Global STS is now emerging as a result of this dynamics. It is a notion that is getting more acknowledged by both outside and inside of Euro-American centers of STS. Ironically, the formation of Global STS as a new direction is facing a counter-movement from the trend in which the world is retreating from globalization. The rise of racially-based nationalist sentiments around the world, especially in the United States and the United Kingdom where STS was born, has serious implications on how science and technology are produced within compartmentalized geographies and ever restricted borders. This panel brings up the challenges raised by deglobalization on Global STS. It asks (1) how Global STS will manage to produce new insights on transnational production of scientific knowledge and technological systems, (2) what strategies should be pursued to strengthen networks of individuals and institutions across the borders, and (3) what theoretical resources should be mobilized to transform the meanings of STS for a global society.
Participants:

Conceptualizing Global STS *Sulfikar Amir, Nanyang Technological University*

While STS has succeeded in elucidating much of the minute sociological structure of technoscience, it has paid less attention to how science and technology is constituted across and between multiple centers and multiple locales. We argue that combining transnational approaches with STS presents new opportunities for generating new frameworks that address some of these challenges and limitations. We call this a "global" STS because this better captures the range of scales at which these new frameworks will function. The "global" label recognizes and emphasizes the truly worldwide connectedness of the flows of technoscience. We suggest four ways in which a Global STS may contribute to new formulations and frameworks for thinking about science and technology. First, a Global STS will place renewed emphasis on the flows and movements that constitute modern technoscience. Second, Global STS focuses critical attention on the relationship between the global and the local. Global STS aims to develop new modes of talking and analyzing across scales, capturing both the globality and the locality of processes. Third, Global STS seeks to account for the multi-polarity of contemporary technoscience. Global STS promises new metaphors with which to describe the multiplicity of relations between people, places, and things. Finally, Global STS will draw attention to new institutional and technological frameworks that are likely to dominate the constitution of technoscience in the twenty-first century.

The Teaching and Learning of STS in an International Context *Bregham Dalgliesh, University of Tokyo; Isabelle Juliette Giraudou, The University of Tokyo*

STS is a wayward child. Spurning its parents, sociology and philosophy, it embraced the interdisciplinary epistemological wave of the 1970s. Almost five decades later, however, the paradigm of STS is confronted by the challenge of making sense to a public that has not been trained in its ways. How can its methods and conceptual armoury be relevant beyond its Western origins? Similarly, how do we teach STS to a student body of an

international undergraduate degree programme that is culturally diverse, multi-lingual and non-STS major? The current paper offers an insight into this challenge at the University of Tokyo and provides an account of the pedagogical path followed in this endeavour, as well as a philosophical reflection upon the conceptual tenets of STS that arise from the experience. Eschewing the lecture in favour of an interactive classroom, we expound on the teaching and learning techniques deployed. These include: terminological clarifications and the problem of the translation of STS concepts into a different philosophical framework; small group work to de-individualise student engagement, which is central to a Confucian context of learning; active-learning classrooms to flatten professor-student and student-student hierarchies; the Socrative application to field questions and solicit ideas from students, who typically avoid engagement and discussion from a first-person perspective; and writing exercises to exteriorise the taciturnity of thinking. In summary, the paper details the experimental teaching methods deployed in an Asian university and questions the value and limits of teaching STS beyond its epistemological and critical (cultural) context.

Transnational and local: Reflections on doing collaborative STS in Turkey *Maral Erol, Isik University; Duygu Kasdogan, İzmir Katip Çelebi Üniversitesi*

This paper investigates the ways to stimulate Global/Transnational STS research and education in Turkey, in a context where the discourse of "national and local" (yerli ve milli) gets increasingly embedded in its technoscientific culture under the current neoliberal conservative government. On the basis of a year-long collective work in an STS platform (IstanbuLab), we discuss the theoretical and practical strategies that we have developed to generate STS in Turkey based on the inter-related realities of its diverse localities without falling into the trap of promoting "national and local" STS. This challenge led us to finding unique examples to analyze with the existing STS literature (like the Kanal Istanbul Mega Project), while simultaneously questioning the theoretical and conceptual tools of Global STS that was developed in and for different contexts (such as the post-truth conversations). On the basis of these inquiries, this paper addresses the challenges in "Translating STS" into the Turkish context. We underline that these challenges derive not only from the still-West-oriented inclinations in STS, but also, are based on the realities of particular social relations in Turkey; these include, doing science in polarized and politically charged environment, and lack of collaborative culture. We conclude with a number of suggestions towards overcoming the challenges at hand, such as the necessity to revisit the question of modernity in STS, and to establish informal and collaborative research spaces outside the boundaries of universities.

Session Organizers:
Sulfikar Amir, Nanyang Technological University
Lyle Fearnley, Singapore University of Technology and Design
Chairs:
Sulfikar Amir, Nanyang Technological University
Lyle Fearnley, Singapore University of Technology and Design

013. Ethics of Science and Technology: A Transnational and Interdisciplinary Investigation

Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: E3.10
Ethical issues are one of the top crucial concerns of STS. From bioethical matters to responsible research and innovation (RRI), various ethical issues exist in science and technology that have been widely discussed. Postphenomenology, a type of STS analysis, presents new ethical issues, focusing on the relation between humans and technology; engineering ethics deals with ethical issues from the viewpoint of professionals engaged in science and technology while applied ethics calls attention to ethical problems that new science and technology can bring. Transnationalism is a characteristic of ethical issues in science and technology. Science and technology activities may be domestic but their influence will cross the borders. Therefore, we need to consider these issues from a transnational perspective. We also need interdisciplinary perspectives to consider the issues. It is true that postphenomenology, engineering ethics, applied ethics, and so on contain significant insights; however, it is unusual that discussions on these issues are beyond their disciplinary borders. In this panel, we will consider ethical issues of science and technology from both transnational and interdisciplinary perspectives. We will have participants from various countries and also participants representing postphenomenology, engineering ethics, and neuroethics. This study will contribute to produce more possible avenues for STS to conduct research on ethical issues in science and technology.

Participants:

Urbanization and the Wilderness *tetsuya kono, Rikkyo University*

Some people recently proposed a new term "Anthrocene", an epoch dating the commencement of significant human impact on the Earth's geology and ecosystems. The negative human impact on the Earth includes the homogenocene, the acceleration of the rate of species extinction, global warming, the rapid change of biogeography, etc. Urbanization is one of the major causes of these phenomena. Modern cities themselves are technological artifacts. They are designed by humans, artificially constructed, and technologically organized and maintained. However, different from other artifacts, cities seem to have a sort of autonomy such that living beings have. A city grows as a coral reef or a forest grows. They develop beyond the prospects of the town planner. Even most powerful politicians can hardly control their development. It is the wilderness that has been eroded by the expansion of human habitat. The definition of a wilderness is "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain". The wilderness has been recognized as having spiritual, philosophical, religious, and democratic values. The objective of sustainable development is to find a balance between human habitat and the wilderness, between urbanization and nature preservation, and between technological artifacts and natural things. What kind of balance is possible and desirable? Is a sustainable city really possible? I will discuss the possibility of sustainable urbanization through the reference to the works on building, housing, and residing by Heidegger, Watsuji, Casey, and other phenomenologists.

Technology and Collective Tacit Knowledge *Kiyotaka Naoe, Tohoku University*

Engineering activity is said to embody tacit knowledge, which gives reliability and smoothness to the operation of a system, enables the relationship between humans and machines (e.g., endoscopic operation), and works as a foundation for knowledge sharing and knowledge creation in a group. Although almost all engineering knowledge is tacit or rooted in non-propositional knowledge, tacit knowledge is usually viewed as being personal, as suggested even by its first advocate, Michael Polanyi. In this paper, however, I focus on the collectiveness of tacit knowledge in engineering processes. Collins contrasts what he calls collective tacit knowledge (CTK) with somatic tacit knowledge , saying that, whereas the latter is personal and reducible to the explicit, the former is embedded in society from the beginning and unique to humans. Departing from the use of Collins's term social Cartesianism , I highlight the phenomenal body (Merleau–Ponty). By presenting an example of chalk factory in which more than 70% of the employees have intellectual disabilities and for whom step-by-step communication is necessary instead of abstract verbal instruction, I examine the flexible structure of CTK with detailed analyses of incorporeal relationships and participatory sensemaking (PSM). Engineering activity is not executed merely in obedience to instructions or rules but has its origin in mutual sensemaking by multiple people. Taking PSM into account, CTK is proven to be knowledge that originates in society or, more precisely, in incorporeal relationships and hovers between tacit and explicit knowledge.

A Framework for 21st Century Engineering Ethics Education
Balamuralithara Balakrishnan, Universiti Pendidikan Sultan Idris

With the rapid development of technologies in this 21st century especially in the field of engineering pose a conundrum for engineering ethics educators. In this new era of Industrial Revolution 4.0 (IR 4.0) that raises new and daunting ethical issues, requires strong understanding and engagement by the future engineers to overcome these ethical issues. Ethics instruction seems to be slow in catching up and address these new ethical issues that emerged in science and engineering world. These issues need to be identified and exposed to the engineering students. Thus, there is a need for a new paradigm of pedagogy in delivering ethics education in classrooms that take into account this new ethical questions. New emerged issues in this era of IR 4.0 bringing in complex ethical problems that need for a strong ethical decision making. Therefore, there is a need for a framework that addresses those issues in engineering ethics education whereby the future engineers could improved their ethical sensitivity, ethical reasoning skills, emotional engagement and understanding of professional and ethical responsibility that could overcome the ethical problems which posed from those emerged issues. This proposed framework with new paradigm of pedagogy will be build via critical examination of literatures in which it will be serving as the cornerstone for engineering ethics educators to prepare future engineers to face the reality of ethical problems in coming years. Overall, the proposed framework for 21st century engineering ethics education could leverage the global perspective of ethics education in engineering field.

The Japanese Manufacturing or "Monozukuri" --- How Can or Should We Globalize the Concept in the Globalized World?
FUMIHIKO TOCHINAI

After World War II, Japan had achieved rapid economic growth to which the Japanese manufacturing industry made a major contribution, and since the late 1990s, a word "monozukuri," which originally means cultivation, has been often used to imply that manufacturing activities practiced by the Japanese is something special that result in high quality products. It is said that the enforcement of Monozukuri Kiban-gijyutsu Shinko Kihon-ho (Basic Act on the Promotion of Core Manufacturing Technology) in 1999 is a trigger of the change of the word usage. In 2010, Malaysia-Japan International Institute of Technology (MJIIT) was founded in Kuala Lumpur, Malaysia as a kind of a faculty in Universiti Teknologi Malaysia. MJIIT emphasizes that it offers the Japanese style engineering education, one of whose core is the concept of monozukuri education; however, the faculty of MJIIT is confronted with a difficulty --- how we should define monozukuri. In fact, the Act uses the term "monozukuri kiban-gijyutsu" (core manufacturing technology) and list 26 core manufacturing technologies, but monozukuri itself is not clearly defined. It seems to be suggested that monozukuri is to manufacture products with the artisan spirit. Then, we come to a question: if the artisan spirit is a key, what is the difference between Japanese manufacturing (monozukuri) and, for example, German manufacturing which is also famous for its high quality products and the artisan spirit. I would like to challenge the question to try to highlight the uniqueness of the Japanese manufacturing, if any, in the globalized world.

Hopes and Challenges of Transnational Neuroethics *Maxence Gaillard, Rikkyo University*

Neuroethics is a new research field labelled in 2002. It is a highly interdisciplinary research field, pursuing many objectives, from the ethics of neuroscience to the neuroscience of ethics. At the global level, the field is growing in terms of number of publications, scholars, scientific societies, dedicated research groups, and so on. While neuroethics was launched mainly from the US and Canada, there was from the very beginning a push to internationalization. However, the diffusion of neuroethics around the globe has not been a smooth and linear process. In this presentation, I study the international dynamics of neuroethics as a conscious strategy of actors and as an intrinsic impetus of the field. I will consider two examples in detail, comparing the reception of neuroethics in Japan and in France. Neuroethics stepped rather early in Japan, but with a mitigate success in the long run. By contrast, there has been almost no proponents of neuroethics in France. The goal of this study and its comparative aspect is to discuss the emergence and the legitimacy of a new field of research. What is the function of internationalization in the legitimization of the field? How the international strategy can be articulated with a nationalization or localization of issues? The very definition of neuroethics—which is a recurring concern of the main actors of the field—is eventually at stake here: Neuroethics is also defined by its context and how it is used by actors in various institutional frameworks.

Session Organizer:
Hidekazu Kanemitsu, Kanazawa Institute of Technology
Discussant:

Hidekazu Kanemitsu, Kanazawa Institute of Technology

014. Transgressive Markets in Assisted Reproduction: Queering family construction in the 21st century
Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: E3.2

The mobilisation of assisted reproduction as a set of diverse practices is quintessentially trans in both construct and operation. The vital resources that constitute the raw materials of this economy are now able to traverse time and space with relative ease by virtue of the emergence of new technologies such as sperm and egg freezing and uterine transplantation; whilst donors and recipients together remake historical conceptions of familial relations by queering both their composition and social organisation. The resulting assemblages are inherently transgressive in nature finding expression in new forms of distributed kinship that have their roots in a variety of localities and cultural contexts and which are bought into being through regulatory protocols that reach across existing borders and legal jurisdictions. Contributors to this panel investigate through original conceptual and empirical research how advanced markets in assisted reproduction disrupt or unsettle existing conceptions of how families should or could be constituted and explore how these new family forms are realised through amalgamations of technologies; bodily and affective labour, corporate strategizing and political expediency. Taking transnational surrogacy, uterine transplantation and social egg freezing as points of departure we together unpack the key controversies that attend the fundamental revisions of the concept and practice of family life that these new technologies both create and demand.

Participants:

Reversing infertility: The political economy of family building through uterine transplantation *Sayani Mitra, Institute of Medical Ethics and History of Medicine*

Assisted reproductive technologies (ART) are known to have expanded the definition of family and taken kindship from the domain of the personal to that of the global, involving actors and technologies dispersed across a transnational 'reproscape'. Uterine transplantation or womb donation is a recent iteration of ART which, unlike any other third party reproductive procedures, aims to provide a cure to complete uterine factor infertility. However, this procedure goes a step further: in permanently severing a healthy though dormant organ (i.e. the uterus) from a woman's body, it carries with it (despite its revolutionary potential) unknown and therefore considerable risks for both donor and recipient. Various rounds of uterine transplants trials are currently ongoing in countries such as the USA, China, the UK, India and others, however, it remains unclear how this technique will be adopted in practice within particular localities; how markets around this novel technology will emerge; accommodate the social relations and emerging intimacies that it generates; or transform existing conceptions of family constitution and kinship. This paper offers a discourse analysis of the scientific communications and social commentaries that attended the success of the first uterine transplant trails to examine how conceptions of the risks and hopes that it evokes are explicated. The paper explores how its promise to reverse infertility and reinstate one's biological potential to reproduce and build family informs the political economy and marketisation of such a 'technology of hope'.

Frozen eggs, Frozen dreams: How oocyte cryopreservation in urban India alter women's approach to family formation *Priya Satalkar, Institute for Biomedical Ethics, University of Basel, Switzerland*

Oocyte cryopreservation for self-usage, commonly known as 'social egg freezing' is slowly taking root in urban India. Though currently accessible and affordable primarily only to financially well-off women, Indian health care professionals are advocating for the 'timely' use of this technology and now actively encouraging young, urban women to cryopreserve their eggs as a guarantee or safe deposit for biologically linked children at an appropriate moment in the future. This emerging technological tool can significantly influence not only women's choices, aspirations and preferences towards family formation but can also alter the traditional expectations around marriage and understandings of family. The ethical debate on social egg freezing has to date mainly focused on the question of whether it empowers women to take control of their bodies and fertility or rather disempowers them by reiterating the importance of producing biologically linked offspring. The goal of this paper is to analyse the impact of oocyte cryopreservation in a more culturally specific context: to explore its impact on the concept and practice of family life in urban India. Using interdisciplinary approaches I tease out the social-cultural and ethical implications of encouraging a large majority of Indian women to adopt the technology and investigate role that key social actors (spouses, in-laws, employers, extended family) are playing in facilitating or prohibiting use of this emergent technology.

The invisible surrogate: Regulatory mechanisms and the erasure of the (re)productive presence of commercial surrogates *Rakhi Ghoshal, Unitedworld School of Law; Bronwyn Parry, King's College London*

Surrogates have become central figures in addressing infertility, yet in India (the world's largest ART market) they remain at the bottom of the ART food-chain. Dangling in a multitude of limbos she barely manages to stand on the shifting sands of constantly changing regulations, counter-regulations and bans. While her physiological role is well-defined, viz. to carry the child to term and then relinquish it, her position within the larger social structure hovers between liminality and erasure. The state's acceptance of her is intriguingly contradictory: while it acquires kudos for banning commercial surrogacy that purportedly exploits 'poor' surrogates, it does precious little to grant her more legal agency and rights. The newly minted Surrogacy (Regulation) Bill 2016 in fact mandates that the birth certificate of children born via such means not mention the surrogate and is thus complicit in erasing not just the voice of the surrogate but her very labour and (re)productivity. The surrogate evaporates the moment the child is born, is erased as the 'birth mother', and from the lives of couples who distance themselves from this 'proof' of their own infertility. Narratives of the relinquishment act as a veneer for the unexamined ontology of being invisibilised. Drawing upon four years of fieldwork in Mumbai and Jaipur we here examine how the surrogate has evolved as a re(productive) labourer and as a category for anchoring our moral battles; revealing how the state, through its very rhetoric of rescue consigns

her instead to the black-box of anonymity and exploitation.

Transnational surrogacy in the post-Soviet sphere: Geographic and geo-political stratifications amongst migrant and commuting surrogacy workers in Russia *Christina Weis, Centre for Reproduction Research; De Montfort University, Leicester, UK.*

In this presentation I trace the trajectories of reproductive labour and delivery of migrant and commuting surrogacy workers in Russia. I explore how markets in surrogacy in Russia rest on and propel mobility amongst surrogacy workers, and how the women's temporary reproductive migrations or regular commutes across Russia's landmass and transnationally from the surrounding former Soviet states, leads to geographic and geo-political stratifications. To do so, I introduce the categories 'migrant surrogacy worker' and 'commuting surrogacy worker' to explore and emphasise these women's exceptional mobility and their different experiences of reproductive stratification amongst each other, and in comparison, to locally living surrogacy workers. Building on Colen's (1995) conceptual framework of stratified reproduction, I draw attention to the inherent geographic and geo-political reproductive stratifications between local, migrant and commuting surrogacy workers in Russia. Depending on their geographic origin and place of residence before and during their commissioned gestational service, surrogacy workers in Russia experience two matrices of geographic and geopolitical stratification. The first matrix concerns how agencies and client parents select and remunerate surrogacy workers according to their origin or place of residence. The second matrix concerns migrant and commuting surrogacy workers' geographically stratified experiences of their pregnancies. This research draws on 15 months of ethnographic fieldwork with surrogacy workers, client parents, agency and medical staff in St Petersburg, Russia, in 2011-2012 and 2014-2015.

Session Organizer:
Bronwyn Parry, King's College London

015. Constituting the Health Research Participant: Value, Assetization and Data Practices in Health Research
Papers for Open Panels/Constituting the health research participant: value, assetization and data practices in health research
Open Panel
9:00 to 10:30 am
ICC: E3.3

The rise of genomic research, big data, and practices that attempt to harness the research potential of routinely collected patient data, present a complex landscape where the role, status and value of the patient or citizen as a research subject is configured in numerous ways. STS scholars have drawn attention to the potential for health research participation to constitute exploitation, empowerment as well as part of contemporary citizenship, while also acknowledging the significance of social context. Others have considered the results of participation in terms of the (bio)value attached to bodily samples through, for example, commodity exchange or the assetization of patients, samples and/or data. Participation in health research has multiple forms, from trial subject to patient advisory group member, from biobank donor to the infinitely searchable database entry. Each of these forms could be understood differently, complicated further by research practices becoming more globally collaborative and thus dealing with multiple local contexts. To date, however, little work has

explored how participation is understood across these local and national borders. This panel examines the varying ways the contemporary health research participant is constituted, valued and assetized from a global perspective. We invite theoretical and empirical contributions from single and multiple healthcare settings to facilitate discussion within and across national borders to explore the changing landscape of health research participation, citizenship and (bio)value.

Participants:

Empowering or Exploiting Donors? Australian Stakeholders' Perspectives on the Ethical and Regulatory Challenges Associated with Biobanking *Miriam Wiersma, Sydney Health Ethics; Ian Kerridge, Sydney Health Ethics; Lisa Dive, Sydney Health Ethics; Edwina Light, Sydney Health Ethics, University of Sydney; Wendy Lipworth, Sydney Health Ethics, University of Sydney*

Biobank networks that have the capacity to store and share biological samples and associated data offer the possibility of an enhanced understanding of the aetiology of disease, and potentially curative treatments. As biobank networks continue to expand across international borders, many ethical concerns regarding the participation of biobank donors remain unresolved – including privacy and ownership concerns, issues around informed consent, as well as the potential risk of commercial exploitation and misuse of 'confidential' participant data. Understanding how local biobanks are responding to these ethical challenges is important in informing future responses. In this presentation, we offer an empirically based overview of the extent of, and ways in which Australian biobanks are contributing to, and engaging with, international biobank networks. As part of a mixed method National Health & Medical Research Council (NHMRC)-funded project entitled "Biobank Networks, Medical Research and the Challenge of Globalisation", we surveyed Australian biobanks, and members of the Australian public. We also carried out in-depth interviews with participants from both groups. We present participants understanding of, and attitudes towards donor participation in Australian and internationally networked biobanks, as well as their views on and responses to the associated ethical and regulatory challenges. We argue that theories of globalisation offer important insights to frame ethical responses to the challenges of potential commodification of human tissue, and benefit sharing between communities and across borders. Word count: 225

Participation and the "Good" Citizen: Using Routine Health Data for Research in National Health Service England *David Wyatt, Kings College London; Christopher McKevitt, King's College London*

Since 2006, National Health Service England (NHS) has reframed itself as both a provider of universal health care and a leader in health research. In the last decade, the NHS has invested in developing and supporting research infrastructures and research projects. Now work is underway to digitalise routine patient records across sites of health and social care so they can be linked together, used for care delivery and mined for research. The repurposing of routine health data for research, often done on the basis of opt-out consent, raises numerous questions about the nature of such research participation, consent and its implications for our understanding of contemporary citizenship. This paper draws on two case

studies, (1) the controversial care.data programme in England which aimed to use all primary care patient records in England for research and commissioning purposes and (2) an empirical study of the process of engaging community members in discussions on a local research database of anonymised, primary care records. It explores how emerging practices of harnessing routinely collected, digital, health data for research present new, passive modes of participation in research and raise questions about the value of the raw and resulting data. The paper ends by reflecting on the implications of such participation for our understanding of citizenship and the 'good' citizen in the context of a country with universal health care.

Speculative Biodata, Materializing Value *Mary Ebeling, Drexel University*

My paper focuses on how biodata assets haunt health information networks in the United States. Such information is often assumed to be "private, bio-based data," as it is produced by patients under legislative privacy protection, but these data undergo innovations and are packaged into data assets that are sold to data brokers. I discuss how innovation dematerializes and transforms health information from "dead" matter into "lively" data, a process that gives birth to both biodata assets that are used speculatively, and to a rematerialization of biodata for target marketing and for credit risk scores, such as the FICO score. The biodata asset is imbued with a "phantom-like objectivity" that takes on a power and agency of its own (Marx 1976, Vol. 1:128). The social conditions of both capitalist medicine and algoritmic regimes in the U.S. help to construct the biodata asset. In fact, a market and risk scoring logic suffuse the anonymization, repackaging, and abstraction of health data (Rajan 2006, 42). This is the value of the biodata asset, and through this transmutation, the data goes on to live a life of its own in the databases of clinics, pharmaceutical companies, health informatics analysts, data brokers, credit card companies, and credit bureaus that directly profit from the buying and selling of biodata assets. Throughout the paper I consider how these interventions raise questions about what is considered public and private information, open data mandates, biodata ownership claims, and how those tensions are exploited by US capitalist medicine and the healthcare industries, especially those companies working in digital health.

The Ethics of Biomedical Research in Low Earth Orbit: The "Twins Study" on the International Space Station *Paola A Castano, Cardiff University School of Social Sciences*

The "Twins Study" is a comparative experiment involving NASA astronaut Scott Kelly, who spent 340 days on the International Space Station between 2015 and 2016, and his twin, retired astronaut Mark, who stayed on the ground and was subject to the same tests as his brother. The study, described as "the dawn of the era of omics in space", involves ten areas of comparison between the subjects with an overall focus on epigenomic changes induced by long-term exposure to space conditions. Spaceflight accelerates various forms of physiological deconditioning and, in this context, the "Twins Study" aims to gain a closer understanding of these processes involving, for the first time, subjects with identical genome. Biomedical research with astronauts

involves particular ethical concerns considering the small sample sizes and the identifiability of the subjects, and this study deepened those concerns given the unique nature of the data. In response, program managers decided that the subjects would have a genetic councilor to understand the implications of the findings and to have the final word authorizing contents for publication. Following the study, this paper examines how ethical issues were addressed in the configuration of the astronaut as a research participant as the investigators dealt with their own concerns regarding the management of samples, statistical significance, and the cumulative nature of their findings. The paper is based on interviews with the ten principal investigators of the study, NASA project managers, documentary analysis, and observations in scientific meetings where results from the study have been presented.

Session Organizer:
David Wyatt, Kings College London

016. Political Transformations of Developmental Origins of Health and Disease (DOHaD) and Epigenetics in the Global South 1

Papers for Open Panels/Political transformations of Developmental Origins of Health and Disease (DOHaD) and epigenetics in the Global South

Open Panel
9:00 to 10:30 am
ICC: E3.4

DOHaD and epigenetics have growing relevance to the health programs around the world and are a key platform in global health initiatives such as the World Health Organisation and United Nations. Issues of nutrition, living and working conditions, environmental exposures, poverty and inequality are key to conceptual understandings of health across the lifecourse and in postgenomic programs such as environmental epigenetics and microbiomics. This panel invites papers that interrogate the ways in which DOHaD and epigenetics intersect with local knowledge and local biologies in the Global South, and the broader politics of governance and biopower that such programs may entail. We envisage themes such as: how DOHaD and epigenetics are translated into cultural practices of reproduction, eating, care and kinship; the uptake of notions of biological plasticity; and how the politics of race, colonialism and violence are imbricated and negotiated in encounters between life science, history and daily lives, particularly in the Global South. These themes are not exhaustive and we welcome other contributions in this field.

Participants:

Eating Ariel Cake: DOHaD and other Matter/ Space/Time Sensibilities in South Africa *Catharina Truyts, Sol Plaatje University*

This paper explores the landscape of norms that categorise time, place, person and substance in Kylemore, a small town in the Cape Winelands of South Africa. Biomedical and public health discourses and social norms identify appropriate brackets of time and place in which women should/should not do certain things so as to secure the best life for their infants, and also – particularly in terms of mothering – constitute themselves as morally good persons. This paper moves between two ethnographic vignettes. In the first, 'icing sugar,' a mother wants to leave the hospital badly, and applies icing from a cake to her newborn baby's lips in order to raise his blood sugar level. In the second, an expensive cake with a print

of Ariel, Disney's little mermaid, is presented (but not eaten) at a baptism. From these illustrations we think about personhood, networks, and non-nutritional forms of care that fall outside of both biomedical and social norms. In response to public health discourse that prescribes the 'right' time and place to ingest certain matter, cake compels us to enquire after other, further, methods of nourishment. These transgress conventional brackets of belonging. From this I develop a way of thinking about how ingestion edits life.

Epigenetic Discrimination: Should We Be Concerned About The Use Of Epigenetic Information By Third Parties? *Charles Dupras, McGill University*

Epigenetic tests may provide predictive information about an individual's disease risk profile. They may also provide information about someone's previous exposures to physico-chemical and psychosocial disruptors of epigenetic mechanisms. These scientific developments have generated increasing concerns about the level of protection of patients' and research participants' privacy and confidentiality. According to some scholars, the degree to which epigenetic databases are secured should be carefully considered. Indeed, it is to some extent unclear how well existing regulatory mechanisms and encryption algorithms, developed for genetic information, are suited to epigenetic information. In this presentation, I will argue that important additional concerns relate to the non-medical use of epigenetic information for discriminatory purpose by third parties. So far, the literature on the matter has been scarce and mostly speculative. However, the rapidly developing interest of the insurance industry and forensic experts in accessing individual epigenetic information is calling for closer ethical scrutiny. Over the past two decades, countries over the world have adopted different normative approaches to protect the public against 'genetic discrimination', i.e. to prevent any person – except for physicians and researchers – from requiring someone to undergo a genetic test, or disclose the results of a genetic test, as a condition to enter into or continue a contract/agreement related to the provision of goods and services. In this presentation, I will show that these policies fail in addressing potential 'epigenetic discrimination', that is the differential adverse treatment or abusive profiling of individuals or groups based on their epigenetic characteristics.

Epigenetic Maternal-Foetal Programming: Correlating Maternal Impression Discourses With Epigenetic Discourses To Address Mother-Blaming Attitudes *Clare Nicholson, UNSW Art and Design*

From Hippocrates until the nineteenth century, pregnant women were accused of influentially imprinting upon their unborn children through their emotional states, diets, personal circumstances and behaviours. This 'condition' was termed "maternal impressions". As a result mothers were considered risky to their infants (e.g., Shildrick, 2000; Mazzoni, 2002; Hanson, 2004; Park, 2010). Consequently, every aspect of maternal life was prescribed and mothers were blamed if they miscarried or delivered a 'malformed' child. Epigenetic "maternal-foetal programming" is the new scientific inquiry into how gestational environmental exposures are transmitted into negative epigenetic traits impressing upon the foetus, causing heritable disease. Increasingly responsibility is placed on mothers to manage and control their environment, including emotional states, socioeconomic status, toxins and diet, despite such advice often being quixotic or entirely unachievable. Historically mothers have been the soft target for society's ills (e.g., Caplan & Hall-McCorquodale, 1985; Fahy, 1996; Jackson & Mannix, 2004; Liss, 2009), therefore utilising historical medical treatise and anatomical art, I draw parallels between mother-blaming from antiquity with current epigenetic texts through sculpture. I believe an urgent need exists to revisit feminist theories relating to societal mother-blaming attitudes, in order to highlight and dispute this latest reiteration.

Epigenetics, gender and population futures: reading 'the first thousand days' from South Africa *Michelle Pentecost, Kings College London; Fiona Ross, University of Cape Town*

As of 2013, nutrition policy in the Western Cape Province in South Africa explicitly focuses on 'the first thousand days of life' measured from conception to two years of age. We show how within this focus, 'the maternal' has been cast as a key frame for interventions intended to produce ameliorated health outcomes for individuals (i.e. life-course based) and for future generations. This builds on longstanding discourses of maternal responsibility, indelibly shaped by histories of racial segregation, racism, structural violence, and the HIV epidemic. In contemporary discourse about risk and potential, the maternal figure is (again) materialized as the site of responsibility and intervention, linked with a moral discourse that extends care of the individual to care of the future and the population, and in the South African case, the 'future nation'. We demonstrate how policy 'foregrounds' certain categories of person and argue that attention to this process is important in understanding how policy settles in the tracks of earlier interventions. We conclude that the renewed focus on 'the maternal' is a 'knowledge effect' - the product of a specific way of asking and answering questions and anticipating knowledge horizons.

Indigenous epigenetics and 'postcolonial moments' *Megan Warin, University of Adelaide*

This paper examines the ways in which DOHaD and nutritional/environmental epigenetics is mobilized in Indigenous Australian contexts. Australia, and Adelaide in particular, has had an important role to play in the historical narrative of DOHaD (through David Barker's work), and the global scientific understanding of developmental origins and nutritional epigenetics more broadly. Applying a postcolonial lens to this science however, unsettles this narrative and produces what Verran (2002) refers to as 'postcolonial moments', creating space for theorizing, interrupting and redistributing power relations. Drawing on preliminary interview data on epigenetics/DOHaD and Indigeneity, I ask what happens to local knowledge practices, both 'scientific' and traditional' when concepts of temporality, kinship, responsibility and relatedness meet in Indigenous and epigenetic moments? Rather than bracket these epistemological and ontological understandings, I look to the shared social imaginaries that constitute these enactments, and the complex workings of power, race and gender in these politics of particular moments.

Session Organizers:
Megan Warin, University of Adelaide

Michelle Pentecost, Kings College London
Fiona Ross, University of Cape Town
Maurizio Meloni
Chairs:
Megan Warin, University of Adelaide
Michelle Pentecost, Kings College London

017. Big Health Data and Algorithmic Authority
Papers for Open Panels/Critical Digital Health Studies
Open Panel
9:00 to 10:30 am
ICC: E3.5
Participants:

Algorithmic authority in the making: When the physiotherapist goes digital *Nete Schwennesen, Copenhagen University*

As human life becomes increasingly entangled with digital technologies, algorithmic systems are becoming a significant part of everyday life. The delegation of tasks to algorithms and their ability to make decisions without (or with little) human intervention has been characterised as a process of algorithmic authority, where algorithms increasingly shape 'who we are and what we see'(Steiner 2012). This paper engage with the concept of algorithmic authority by way of analysing the affective and material processes through which algorithmic authority is created, negotiated and sometimes broken down. The study is based on an ethnographic exploration of the implementation of a smart phone application for the promotion of home-training for patients who have undergone hip replacement surgery in Denmark, and explores what happens when algorithms are designed to take on tasks in the arena of physical rehabilitation.

Digital Epidemiology, New Data and Old Models *Lukas Engelmann, University of Edinburgh*

Computational epidemiology has become the backbone of public and global health. Data collection, algorithmic analysis and digital visualisation have come to define the standards of true and reliable pictures of health in society (Krieger 2011). Digital Epidemiology claims a disruption, exploiting new repositories of social media, search terms and location data to provide real-time surveillance. But uncertainty prevails despite the data deluge and epidemiology has yet to demonstrate that big data brings new transparency and improves containment strategies, treatment allocations or prevention programmes. For example, understanding which factors drive type 2 diabetes still leaves us with over 700 plausible interventions on population level, each alone just minimally adjusting risk (Wareham 2018). However, will more information ever solve epidemiological entropy and close the infamous gap between trial efficacy and real-life efficiency? (Kosoy and Kosoy 2017). Bridging these gaps, proposing plausible interventions and structuring feasible prevention strategies despite prevailing uncertainty, this paper argues, remains a task still trusted overwhelmingly to standard-models, used in epidemiology for almost a hundred years (Morabia 2004). While the sheer volume of new empirical digital data creates a new optimism about the 'end of theory' in epidemiology, this paper follows the curious resilience and persistence of traditional concepts and models. Based on semi-structured interviews with epidemiologist and a close analysis of models in their historical background, this paper will ask how trust in new data operates differently from trust in old models and to what extent computational and digital epidemiology continues to draw its authority from century-old theory.

Health Must Be Defended Algorithmically *Tzung-wen Chen, National Chengchi University*

This article utilizes Simondon's concept of individuation/individualization in accompaniment with 'algorithmic governmentality' (Rouvroy & Stiegler 2015) to investigate the phenomenon of precision medicine in the post-genomic era. The notion of precision medicine creates new biomedical fields such as immunogenomics and precision oncology, which are also cases of study in the article. Operational procedures in these new fields are similar: sample collection from patients, genome sequencing, informatics analysis, interpretation and clinical process. These procedures go beyond tasks of physicians who are in face of the patients, and extend to a series of mathematical and computational work mostly contributed by bioscientists and bioinformaticians. From the genome sequence of a patient to a personalized approach to disease prevention or treatment forms a circle which starts and ends at an individual patient. Underlying the circle is a second circle consisting of two parts: a demi-circle from genomic Big data to the precision medicine, driven by algorithms, and another demi-circle from the precision medicine to the Big data, via accumulation of patient cases. The second circle is in fact a loop that circulates and re-circulates between two ends: collective level and individual level, which corresponds to a Foucauldian model of biopower, and can be described as 'algorithmic governmentality.' Furthermore, there is a horizontal shortcut between the two demi-circles, from accumulation and representation of the patient cases to the algorithms, and interfering the algorithms. The shortcut is a visual process in which representations of the cases transform into innovations via individualization, rather than individuation. This visual way of transformation takes place in 'milieu'(Simondon, 1989). That is, it is a domestic source of innovations, and of illusions as well, of these new medical technoscientific fields in a wider global context. Simondon and the algorithmic considerations of digitalized and (bio)informatics health are heuristic for STSers to think reflectively on the emerging precision medicine.

Is big data reworking public health's "Prison of the Proximate"? *Niamh Stephenson, UNSW Sydney*

Public health researchers', practitioners' and policy-makers' interest in big data has grown rapidly In the decade since Wired magazine proclaimed "The End of Theory: The Data Deluge Makes the Scientific Method Obsolete" (Anderson, 2008). Whether explicitly or implicitly, public health mobilises specific theories or concepts of the population (ranging from approaches that forge the "prison of the proximate" via their focus on individual risk factors, through to concepts of "the population" as situated in social, political and environmental contexts). These differences matter, as they inform more or less just and more or less effective responses to health inequities at the population level. Some public health actors anticipate a future in which "precision public health" will dispatch with the fraught problem of what constitutes a population, embracing promises about "the end of theory". Others contest it, e.g. they point to the methodological and theoretical expertise

informing the development of functional algorithms, and often cast big data as a new frontier into which public health expertise can expand. This paper interrogates experimentation with big data for disease prevention to ask whether the turn to big data is dismantling or fortifying public health's prison of the proximate, or introducing new ways of thinking collectivity and the population for public health.

"You Must Click the Button and Donate": Online Crowdsourcing to Fund Unproven Stem Cell Treatments
Claire Tanner, The University of Melbourne; Megan Munsie, The University of Melbourne
Many people who undergo unproven stem cell-based interventions seek financial support from their communities to fund what are often costly treatments and associated expenses. Crowdsourcing has been identified as a key way people raise funds for a host of medical treatments, however little is known about people's use of online fundraising sites to fund unproven stem cell-based interventions. This paper draws on quantitative and qualitative data collected from two popular contemporary fundraising sites (GoFundMe.com and YouCaring.com) in order to garner insight how these sites are being used across different geographical locations to fund purported 'stem cell treatments' that have no or weak scientific basis. In addition to mapping the use and success of these online campaigns by people with different health conditions in different locations, we consider the range of visual and discursive techniques that are employed to attract funds for treatments. In so doing we draw on the work of Anne-Marie Mol and John Law to consider how the practices of online crowdsourcing enact certain 'realities' about potential patients, stem cells and their therapeutic potential. To conclude we consider the socio-cultural and ethical implications of online crowdsourcing for non-evidenced based treatments in the context of national and global healthcare.

Session Organizer:
Deborah Lupton, University of Canberra
Chair:
Deborah Lupton, University of Canberra

018. How Do They Understand the Science? Communicating Science, Risks, and Disasters 1
Papers for Open Panels/How do they understand the science? Communicating science, risks, and disasters
Open Panel
9:00 to 10:30 am
ICC: E3.6
Recent disasters have put science into the spotlight and have allowed non-scientists to see how science operates in their daily lives. Climate change, earthquakes, violent storms, wildfires, and epidemics have been a few of the disasters that cross borders and dominate our headlines. Scientists have their own understanding of these disasters, and work on a bedrock of science that is comfortable with uncertainty (be it in reporting a margin of error, or in talking about approximations rather than absolutes) and tend to expresses risk in terms of numbers and statistics. In turn, science communication, as well as disaster communication, often operates on the principle that people do not know the facts well enough and need to be informed about them (the so-called "deficit model"). Recent research, however, shows that such a model takes little account of the culture and perceptions of risk of the audience. Research likewise shows that the process of communicating

scientific knowledge to reduce risk in disaster-prone areas, or of getting a disease or a health hazard, is usually carried out with little understanding of how the community would understand and act on such knowledge. We invite researchers who work in science and risk communication, especially those who examine the audiences who received information about risk and disaster to contribute to our panel. We look for papers that would shed light on the unique epistemologies of our audiences, and how these understandings can change how they view the world, and the role of science in it.
Participants:

Climate Change Risk Perception in Southeast Asian Countries
Midori Aoyagi, National Institute for Environmental Studies; Vu Quoc Huy, Institute of regional sustainable development, Vietnamese Academy of Social Sciences
Recent extreme weather in all over the world effect on people's everyday lives and also on the perception of climate change. We are currently working on the project about people's lifestyles and sustainability in Southeast Asian countries, such as Thailand, Vietnam, and Myanmar. In interviewing people about everyday lives, we realized that people often mentioned about the recent extreme weather, such as flood, or Typhoon, especially in southern Vietnam. People often connected natural disasters or other accidents with climate change. Sometimes they said, "I watched it on the television." Most stories are about "adaptation" aspects of climate change. People hardly referred to the so-called "mitigation" aspects of the climate change, such as saving energy. In those regions, income restriction limited household energy consumption. People have to save energy for the sake of saving own money. In this paper, we report the public perception of climate change in Southeast Asian countries and their understandings of climate risk.

Communicating Uncertainty in Medical Genetics *Colin Halverson, Vanderbilt*
Laboratories regularly return a class of results from genetic testing called variants of uncertain significance. These variants are unexpected discoveries, but so little is known about them that they cannot be classified as either disease-causing or benign. Most important is that they are not meant to be used in informing healthcare behaviors. Their implications for a patient's wellbeing are fundamentally unknown. When patients receive this information, their clinicians repeatedly underscore the uncertainty of these results and reiterate that they are not 'medically actionable.' However, my qualitative interview study has shown that many patients (nearly half of my interviewees) interpret the clinicians' claims of non-knowledge as ascriptions of risk and proceed to alter their health-seeking behaviors according to their reinterpretations of the uncertain genetic variants. In my talk, I discuss three cases of such reinterpretations – including fears related to misattributed paternity, stomach cancer, and life expectancy – and argue that popular background understandings of healthcare lead to a conflation of non-knowledge with precarity. I argue that interventions against medical advice are attempts to control and moderate potential vulnerabilities. In so doing, I lay out a tripartite schema of non-knowledge in disclosing test results in Medical Genetics – risk, uncertainty, and randomness – and propose a model for communicating the differences between them across the epistemological divide to the lay patient.

How Laymen Perceive Outbreaks of (Re-)Emerging Infectious Diseases: the Case of Poland *Lucas Afeltowicz, Institute of Sociology, Nicolaus Copernicus University, Toruń, Poland; Michał Wróblewski, Nicolaus Copernicus University in Toruń, Poland*

Media very often cover epidemics of (re-)emerging and emerging infectious diseases (REIDs). Those disasters, including outbreaks of ebola, Zika, SARS, are studied and monitored by specialized agencies such as CDC and WHO. REIDs are considered important because local outbreak can easily propagate, transgressing social boundaries and crossing national borders. REIDs epidemics are complex phenomena. Scientists are able to them to model outbreaks, predict them and contain. Does this knowledge is transferred from experts' discourse to public discourse? Does scientific representation of REIDs translates into how laymen perceive those threats? The first transfer of knowledge (from experts' to public discourse) has been investigated quite well in sociology (dynamics of epidemics media coverage in response to levels of actual risk, research concerning moral panics in relation to REIDs etc.). The second transfer (from public representation to individuals' perception of REIDs) still requires further investigation. Our research focuses on both areas of knowledge transfers. Currently there is survey study under preparation (the data will be collected among adult Poles after second flu season, April 2018; N = 600, personal interviews; the sample will represent the general populations in terms of sex, education, income distribution; the study will control such factors as political preferences). The survey will reveal how laymen perceive risks associated with REIDs in comparison to other risks, how they estimate the probability of outbreaks, do they trust in public institutions devoted to prevention of REIDs. The results of the survey will be interpreted in context of media discourse analysis.

Knowledge and the Scientific Imagination: Does Experience Always Become Memory? *Maria Inez Angela Zamora Ponce de Leon, Ateneo de Manila University*

Research in the social studies of science tells us that facts are always imbued by values: people never accept knowledge as fact, but experience it in their contexts. How might this be reflected in perceptions of flooding and storm surge risks in a country like the Philippines, which is surrounded by water? How is science understood as both discipline and source of information? We use focus group discussions and interviews with communities to examine how they understand the concepts of flooding and storm surge risks, and how their worldviews matched those who worked in government. We found that knowledge, memory, imagination, and action appear to be four distinct concepts. While people know how strong a storm is or how deep floods can become, they do not necessarily see the knowledge as something to be acted upon. Memory of a typhoon's strength, in some cases, even impeded action: if people had survived previous storms, they could not imagine not being able to survive worse ones. Imagination, it appears, is tied to the ability to see before and beyond, and to therefore anticipate danger based on trends. This shows us that the perception of risk is not only value-laden but pulled in different directions by experience. This also shows us the nature of the scientific imagination: the ability to forecast trends might not apply across communities or beyond the bounds of science. Exploring people's scientific imagination has implications for how science (especially climate science) is communicated, especially in climate change vulnerable countries.

Session Organizers:
Maria Inez Angela Zamora Ponce de Leon, Ateneo de Manila University
Anto Mohsin, Northwestern University in Qatar

Chair:
Maria Inez Angela Zamora Ponce de Leon, Ateneo de Manila University

019. Neurosocieties: Interdisciplinary Explorations of the Brain, Culture and Ethics 1

Papers for Open Panels/Neurosocieties: Interdisciplinary Explorations of the Brain, Culture and Ethics
Open Panel
9:00 to 10:30 am
ICC: E3.8

In the last two decades the neurosciences have become a highly prestigious and influential force in contemporary societies. The significant symbolic and financial resources invested within neuroscience research (e.g. the EU's Human Brain Project, and the US' BRAIN Initiative) as well as its translation into practice and policy raise a number of pressing issues for social scientists, bioethicists and STS theorists in particular. Thus, the Neurosocieties interdisciplinary open panel will address themes such as: the influence of brain-based explanations of personhood, health and behaviour in contemporary communities; how these explanations align and conflict with other ways of making sense of personhood; new social forms emerging in response to the rising prestige of neurosciences; and the responsible management of the expectations of patients, families and carers regarding promising neuro-interventions. Additionally, recent developments within the neurosciences – particularly the emerging interest in culture and social context – have created new opportunities for productive engagement between neuroscience, social science and ethics. Accordingly, the interdisciplinary panel will call for papers from STS, anthropology, philosophy, bioethics and related disciplines that explore new options for conceptualising: the relationship between brain, body and environment; the relationship between thinking, feeling, mood and cognition; understandings of agency and moral responsibility; and interdisciplinary perspectives more generally, on the brain, personhood and culture. The panel will prepare the ground for an interdisciplinary special issue on Neurosocieties.

Participants:

Brain-based parenting: caring for our kids' cortisol? *Celia Roberts, Lancaster Univ.*

In an online discussion of adoptive parenting hosted by a large UK charity, an experienced adopter tells a 'newbie' that her child's difficulties at home and school might be related to high cortisol levels. The intrigued newbie asks 'Can cortisol be measured?' and discussion ensues. This is the new world of 'brain-based parenting'; a practice that British parents are increasingly encouraged to learn. Adopting parents - notably those whose children were neglected or abused in early life - are at the forefront of this shift. Trained by social workers, psychotherapists and other parents, adoptive parents are asked to grasp principles of developmental neuroscience and to learn to know, for example, when their child is 'in their primitive brain' or in 'flight or fight mode.' This paper critically examines the phenomenon of brain-based parenting,

focussing on the monitoring and management of the so-called stress hormone 'cortisol' and associated neurological and behavioural cascades. Based on ethnographic readings of scientific and parenting literatures and ten years of observant participation in the adoptive field, it argues that brain-based parenting should not be figured as a simple biologisation, but rather as an important opportunity to rethink the complex relationships between embrained bodies and relational practices of care. If human brains are now understood scientifically as social and relational (Rose and Abi-Rached, 2016), parenting becomes a key site for rethinking how brains develop in relation to others and, conversely, how 'ordinary people' engage with technical scientific knowledge in their intimate lives.

Cerebralizing Attachment: How Have Parent-Child Relationships Come to be Explained as Brain Facts? *Bican Polat, Tsinghua-Michigan Society of Fellows*

With advances in neuroscience, we have come to observe the ascendancy of a certain view of the human, which equates our condition of being minded with having brain states. As the proponents of biomedical psychiatry have embraced this cerebralizing agenda to construct etiological models, the neurobiology of attachment has emerged as a prominent subfield based on the research activity of a network of laboratories in North America. From the 1980s onwards, the knowledge output of these laboratories has led to the identification of certain interactional states in caregiving relationships that contribute to early brain maturation. This investigative paradigm has thus brought to the fore notions such as neuroplasticity and resilience while also shaping popular discourse on parenting and interpersonal intimacy. As neurobiological knowledge on presumably stable cerebro-substrates (e.g., oxytocin, the "cuddle hormone") acquires extra-scientific gloss, a question remains concerning the social processes in which its objects have come to be declared natural. How is the lived complexity of caregiving constituted as an object of naturalistic inquiry? In what ways do the intimate features of interpersonal relationships come to be parsed into measurable biological processes? This paper provides a contextual analysis of the research activity of two neuroscience laboratories that have played a key role in the construction of "attachment" as a natural kind. Drawing on both historical and ethnographic evidence, I explore the investigative practices of an experimental system that have led to the characterizations of early emotional relationships as "brain facts," which travel across various medico-scientific and social worlds.

Neuroscience At Work: Neurobiology, Trauma and Feminist Work Against Sexual Violence *Suzanne Therese Egan, University of Sydney*

Neurobiological explanations of social issues have entered fields as diverse as education, health, social welfare and criminal justice. This paper focuses on the effects that neurobiological approaches to psychological trauma are having on policy and service provision in relation to violence against women. Drawing on qualitative research (document analysis, interviews) conducted in Australia I examine the ways in which practitioners in feminist sexual assault services draw on and integrate neurobiological understandings of trauma into their work, most notably to assist victims and survivors with the myriad of material bodily problems that they present to services. Not without some cause, feminists have been wary of biological essentialist tendencies in the neurosciences and bio-medical interventions into rape trauma, in particular, have been critiqued for de-politicising rape to a problem of individual adjustment. However, using the above research as a springboard, I argue that this uptake of neurobiology in practice offers rich possibilities for feminist theoretical work on sexual violence. The final part of the paper explores possibilities for reintroducing a (non-essentialist) biology of the body into theories of sexual violence and bringing feminist new materialist work (i.e. Rosi Braidotti, Elizabeth Wilson) and feminist theories of sexual violence into a productive dialogue with the concept of trauma. This paper provides an insight into what neuroscientific knowledge can 'look like' when put to work in setting far removed from the laboratory and into the productive rather than reductive possibilities of an engagement between neuroscience and politicised fields - such as feminism.

Ethical and Psychological Reasons Behind the Importance of Limits on Our Expectations of Neural Organoids *Anna Blum, UNSW*

This paper draws on work in philosophy of mind, ethics, and psychology to suggest some limits and ethical concerns related to certain new neurotechnologies, in particular 3D bioprinted neural organoids. These structures, created by 3D bioprinting neurons with specific genetic criteria, self-organize into brain-like structures complete with neuronal activity that accurately replicates what we expect to see in vivo. In some cases, specific regions of the brain can be developed in vitro, allowing scientists to study these regions in greater detail and even "fuse" a variety of specific brain regions together. By studying the neuronal connections between these fused regions, scientists hope to be able to "analyze complex neurodevelopmental defects using cells from neurological disease patients." While this development is very promising, and predictions have been made that this technology will be instrumental in developing new treatments and potential cures for a variety of diseases and disorders, we must be careful that the hype surrounding a new technology does not supersede the new technology's actual capability. This paper urges cautious optimism in the face of this type of new neurotechnology, and expands on the reasons why such caution is important.

Ethics and the Social Studies of Science in Neuroethics *Eric Racine, Institut De Recherches Cliniques De Montréal*

Ethics and social studies of science would appear to have much in common, in particular given the rise of empirical ethics and what some describe as the "empirical turn" in bioethics. However, a closer look at current bioethics scholarship and the particular case of the recent field of neuroethics in North America reveals important divides. These divides fall along the lines of disciplinary orientations such as (1) more philosophy-oriented views of ethics scholarship; (2) more health-sciences oriented views; (3) and more social sciences-oriented views. The differences between these approaches are explainable by practical reasons, programmatic reasons, and theoretical reasons, notably ethics' claimed special "normative" status. The latter is often interpreted, in philosophical

ethics, as generating a number of epistemological and theoretical problems for the integration of empirical research. These problems include the fact-value distinction, the is-ought gap, and the naturalistic fallacy. These concerns take root in a deductive and abstract model of ethics where empirical research makes little if no sense. In this talk, I will describe some of the challenges encountered in my own interdisciplinary neuroethics research program which integrates empirical research. I will explore the kinds of promising answers that pragmatism offers based on a model of ethics that inherently connects empirical research on morality and normative ethics and criticizes what Dewey called the "spectator theory of knowledge".

Session Organizer:
 John Grant Gardner, Monash University, Australia
Chairs:
 John Grant Gardner, Monash University, Australia
 Cynthia Forlini, University of Sydney

020. National Identities and Transnational Science and Technology during the 20th Century: Historical Perspectives
Papers for Open Panels/National Identities and Nationalism in Transnational Science and Technology during the 20th century
Open Panel
9:00 to 10:30 am
ICC: E3.9
Participants:

Producing 'the Company': Cultural Politics and the Crisis of Brazil's Embrapa *Ryan Nehring, Cornell University*
The Brazilian Agricultural Research Corporation (Embrapa) is a public company that "provides research development and innovation solutions for the sustainability of agriculture in the benefit of Brazilian society". Embrapa was established at the height of the military dictatorship and Cold War politics in 1973. Their claim to fame is the modernization of Brazilian agriculture over the past fifty years. Embrapa's model is based on the concentration and adaptation of Western scientific expertise by funding the education of Brazilians abroad over decades (mostly in the U.S.). My paper analyzes the cultural politics and identity of Embrapa and its scientists to show the ways in which transnational relations (through education and research collaboration) shapes and is shaped by the Brazilian state and national politics. Embrapa is the 'crown jewel' of the Brazilian state and, until recently, has been held up as a national treasure. Over the last decade, however, party politics has entered Embrapa's administration and stifled scientific research by overly burdensome bureaucratic regulations. I argue that the institutional culture at Embrapa is the product of a belief in Western scientific expertise as an organizational principle for the company combined with a constant struggle against and fear of the institution's bureaucracy and national politics. The paper draws on, critiques and contributes to Brazilian literature on national identity and politics as well as the burgeoning subfield of postcolonial Science and Technology Studies. It is based on ethnographic research conducted at Embrapa headquarters, its various research centers and government ministries throughout 2017.

Identifying Essential Properties of Today's Science and Technology via Historical Perspectives *Yasushi Sato, Japan Science and Technology Agency*

The phenomenal unfolding of science, technology, and innovation in the last several years, sometimes dubbed "the Fourth Industrial Revolution," has been a source of great expectation as well as concern in today's world. However, any dispassionate analysis of the essential nature of today's science and technology would need sound historical perspectives, because today's science and technology has to a large extent resulted from the massive, continuous postwar investment in R&D by governments and corporations. This paper is an attempt to present a version of such macro historical perspectives, by integrating the literature on the history of postwar science and technology. It identifies six main historical threads: (1) growth in the size and complexity of technological systems under the Cold War, (2) relativization of scientific and technological authority in the age of détente, (3) increased concern for economic values of science and technology in the context of trade war, (4) trend for networked science and technology in the globalizing world, (5) heightened risk consciousness accompanying the maturation of democracy, (6) vocal espousal of innovation by developed countries afflicted with deepening sense of crisis. These six trends, reflecting the political, economic, and cultural imperatives of respective times, have left marks on the overall properties of contemporary science and technology. This paper will thus propose a crude and preliminary yet holistic way to understand the historically-shaped structure of today's science and technology, combining historical and policy scholarships in STS.

National Biobank and Nation-building : The Case of Taiwan Biobank *Yu-yueh Tsai, Institute of Sociology, Academia Sinica; WanJu Lee, Institute of Sociology, Academia Sinica*
The completion of the Human Genome Project in 2003 heralded the coming of the 'post-genomic era' when large-scale population- and national-based biobanks have been initiated around the world. This article argues that the national genetic project, Taiwan Biobank, has contributed to Taiwan's national building by examining 1) state policies changing from pursuing a "Sci-Tech Island" to "an island of biomedical technology" under the context of upgrading national economy and global competition of biomedicine and ; 2) the discourses about the uniqueness of the Taiwanese genome as a niche in the competitive global biomedical market and 3)the enormous potential the Taiwan Biobank has for contributing to the health of Taiwanese future generation. Influenced by the identity politics emerging since the 1990s, the representative significance of biomedical research sample regarding human classification has shifted from "Chinese" to "Taiwanese." As a result, the Taiwan Biobank has involved new imaginaries of Taiwaneseness. Such imaginaries as "Taiwan must have their own laboratory," "the four great ethnic groups are representative of Taiwanese unique genetic composition," and "Research of Taiwanese genetic attributes must enter the global arena," and the like are deeply embedded in the context of identity politics characterized by the advocacy of the idea of "Taiwanese subjectivity," "multiculturalism," and "inclusive treatment of new immigrant" since the 1990s. By exploring how the discourse of "the Taiwanese genome as a niche" has being constructed, the article points to the close relationship between life genetic science, technology, and

nation-building in the post-genomic era.

Session Organizer:
Barbara Silva, Universidad Catolica de Chile
Chair:
Barbara Silva, Universidad Catolica de Chile
Discussant:
William San Martin, Massachusetts Institute of Technology (MIT)

021. Risks and Standards in the Knowledge Circulation of Science and Technology for Development
Papers for Open Panels/Risks, Standards, and Knowledge Circulation in Nuclear and Radiation Science and Technology for Development
Open Panel
9:00 to 10:30 am
ICC: E5.1

Standards and standard-setting have played major roles in the development of modern sciences since the nineteenth century. Since the Second World War, the stakes for doing science and developing concomitant technologies have increased. A number of governments, emerging international agencies, and large-scale scientific infrastructures begun to take an active interest in the function of science and technology as developmental and political tools. But in the process of developing science and technology for developmental purposes, ethical issues emerge whereby decisions for allowing a particular implementation of a technology lead to disasters, accidents, and even long-term hazards not accounted for during the planning stage. This panel will consider the different forms of risk management in the deployment of science to technological implementation, from areas such as health physics to radiation and harmful chemical exposure. Normative and non-normative questions relating to risk and its relation to safety standards are explored in this panel through the different country level case studies from China, Japan, Malaysia, and the EU. The exploration of risks will also not be complete without the consideration of stakeholder accountability, public perception, and the scientific communication of the risks, as these are essential aspects of governance and knowledge management in any developmental agenda.

Participants:
Calculation Automates the Decision: Contested Imaginaries of Real-time Radiological Simulation and Probabilistic Risk Assessment for Nuclear Emergency *Kohta Juraku, Tokyo Denki University; Shin-etsu SUGAWARA, Central Research Institute of Electric Power Industry*

It is a widespread notion that quantitative calculation of technological risk should help better our decisions concerning risk management and emergency response for nuclear utilization. Both risk assessment techniques and computer simulation systems are believed to be essential for this purpose. After the Fukushima nuclear accident in 2011, the Japanese nuclear community was criticized for failing to digest and implement such "international standards." After the Fukushima accident, although efforts have been made to fix such insufficiencies, the authors have witnessed highly polarized and stereotyped disputes: probabilistic risk assessments (PRA), or the System for Prediction of Environmental Emergency Dose Information (SPEEDI) are deemed either totally useful, or utterly useless. The imaginaries held by relevant stakeholders on methods of risk quantification and its consequences are contested, but at the same time partly unanimous. Based on recent publications on the SPEEDI case, which points out the social dysfunction of the "certainty zigzag" situation, a variant of Donald MacKenzie's 'certainty trough' concept, the authors will discuss the negative implications of this situation, such as the obstruction of practical, effective implementation of such technologies. It is suggested that relevant actors with less expertise tend to hold a stronger belief that "calculation should automate decisions and thus prevent regrettable consequences." They deny any flexibility in the interpretation of the outputs of those methods. Taking the disputes concerning PRA together into consideration, the authors will critically discuss a kind of scientism which allowed the failure trajectory of public policy for nuclear emergency preparedness.

Expert debate on nuclear severe accident management standards: the case of corium treatment *Ismail Mael Goumri, IRSN*

The two nuclear disasters of the last decades (Chernobyl and Fukushima) caught the attention of regulatory bodies regarding the importance of accident consequences mitigation. The treatment of the radioactive lava produced during an accident is now considered a crucial issue for nuclear safety. The behavior of this lava, called "corium", is still difficult to predict and it can lead to significant soil and ground water pollution if it melts through the concrete foundation. That is why the IAEA decided in the early 1990s to establish a task force to determine new standards for third generation reactors which implement a corium management strategy. Two main strategies are presently in competition: the "In-Vessel Retention" and the "Core-Catcher", and these have sparked international debates amongst experts. This paper aims to present ongoing research into the international determination of new standards. I will present the anthropological work I undertook on the H2020 "In Vessel Melt Retention" (IVMR) international research and expertise program led by the French Institut de Radioprotection et de Sûreté Nucléaire. This project aims to produce an international consensus on the ability of In-Vessel Retention to cope with a large core meltdown. It reveals the uncertainties of this method due to the lack of knowledge and the widespread use of sometimes contested models. It also shows the difficulty in reaching a consensus on standards due to the local particularities of national licensing processes. This may explain why some of these new reactors are already under construction despite the present lack of consensus.

Managing Protection: The Role of Health Physics in Shaping Radiation Risk Knowledge Paradigms *Shi Lin Loh, National University of Singapore*

The concepts of radiation protection and radiation risk management originate in the profession called health physics, a multi-disciplinary field instrumental in creating standards and programs for their implementation. Yet how exactly are "health" and "physics" linked in the expertise that this field's practitioners wield over areas ranging from waste disposal, accident management and other safety practices? Health physics as a distinct discipline emerged during the years of the Manhattan Project, and became a visible specialty in the late 1950s, following the atomic bombings of Japan and the beginning of nuclear weapons testing. In this paper, using accounts from professional journals and official records, I trace the evolution of health physics as a field of expertise

in the United States and its diffusion into Japan during the growth of the latter's nuclear industry in the 1960s. I argue that doing so illuminates the ways in which the profession and its founders in the U.S. played critical roles in promulgating standards for operating and managing radiation technologies, as well as creating knowledge paradigms of radiation risk as an inevitable yet ultimately manageable phenomenon. An STS-inflected analysis of health physics is in dialogue with a growing body of work which studies the history of radiation protection by national and international agencies (e.g. Boudia 2007, Higuchi 2015). It further provides greater insights into how evolving sociotechnical configurations of standards in radiation protection have co-produced understandings of radiation risk in relation to public and individual health.

PX project's Development in China: Recommendations for public involvement in decision-making *Kunru Yan, South China University of Technology, China; Michael Gorman, University Of Virginia*

Because of public protests, development of PX project in China is suffering hardship, but in the United States, Australia, Britain, Japan and other countries, the public holds positive attitude towards PX project's development. Such phenomenon indicates that there exists discrepancy in PX project risk perception. The risk is of objectivity but of subjectivity. Different subjects on the same risk have different perception, due to objective factors, such as unpredictability and non-controllability of risk as well as subjective factors, such as subjects' knowledge about risk, attitude and perception strategies to risk. To eliminate or reduce such perception difference and promise the safe and orderly development of PX project in China, the public should participate in the decision-making process.

The Public's Right to Know: Communicating the Science of Radiation Risks and Standards in Malaysia *Clarissa Ai Ling Lee, Sunway University*

With Malaysia as case study, this presentation is interested in exploring the intersection between scientific cultures, scientific literacies and agnotology (ignorance) in relation to how epistemic and informational justice are enacted in the communication of risks and safety of radiation from non-nuclear power plant sources and radioactive wastes; then compare the issues raised in relation to safety standards and security as the state prepares for the possibility of constructing nuclear power plants. As an emerging market for nuclear energy, Malaysia is currently in the process of assessing its nuclear science and technological capacity, and is therefore, a target of vendors looking to offload their products. The introduction of technology with hidden features, or one which the nation may not yet have the technical expertise to back-engineer, requires the assessment of new risks being introduced while igniting again, the issue of trust and technological determinism. This presentation will then consider how secrecy and suppression of information pertaining to radiation safety and hazards with the intention of avoiding public panic produce the adverse effect of increasing distrust from the public towards the authorities tasked with implementing nuclear energy technologies. While the authorities may argue that such suppression is for the public's good due to the latter's ignorance about the intricacies of the science involved and therefore, lacking in the ability to interpret the technical information accurately, the public will interpret this as subterfuge by the authorities. Finally, this presentation will consider the role of informational activism in clarifying or confusing issues pertinent to radiation risks and safety among emergent adopters of nuclear energy, and how Malaysia might be part of that conversation.

When the lessons of an accident are known 40 years before it happens *Mathias Roger, IRSN*

Which lessons have been learnt from the Fukushima Daiichi accident with respect to seismic hazard? Moreover, what elements were taken into consideration in the distinction between the lessons that had to be learnt and the ones to leave asides? At the turn of the 1970s, nuclear safety emerge as a specific and transnational field which developed a common seismic risk approach to prevent such risk for all Nuclear Power Plants around the world. Exploring the genesis of nuclear safety as a field, this paper aims to figure out how it is structured over dichotomies between knowledge and absence of knowledge, thinkable and unthinkable boundary, and orthodox and heterodox paths. Following Bourdieu, fields, as long as they remain autonomous, create and control simultaneously a legitimate way of doing things and a legitimate way of criticizing this way of doing. Therefrom Nuclear Safety as a field is also structured with a legitimate way of assessing risks and taking them into account and a legitimate way of assessing this process. I will demonstrate in this paper that the seismic safety improvements after Fukushima accident have been conditioned by how this risk was considered and institutionalized during the designing period of Nuclear Power plants (1965-1975). This analysis will show that the materialization of a state of knowledge and a know-how in building design ensured both continuity and autonomy of nuclear safety field over time and events up to determine what should be learnt from Fukushima's event.

Session Organizer:
Clarissa Ai Ling Lee, Sunway University
Chair:
Clarissa Ai Ling Lee, Sunway University

022. Automation and the Transition to the Robotocene: Towards a Robotocene?
Papers for Open Panels/Automation and the transition to the Robotocene
Open Panel
9:00 to 10:30 am
ICC: E5.10
Participants:

Robotocene: Sociotechnical imaginaries of a robotic future *Roger Andre Søraa, NTNU*

"The robotic future" is a theme that has for a long time fascinated writers, artists and futurists alike. The sociotechnical imaginaries of the increased automation of our societies are strongly embedded in the potential – and fear – of what such futures might bring. With this paper, we introduce the term Robotocene in order to explore different manners in which the world is becoming more robotic, and what implications this may have for humanity. We will especially focus on robotization of the healthcare sector, the agricultural sector and building industry, seeing how robots are increasingly taking over

specific tasks previously conducted by humans. The imaginaries of future work will be a core topic explored, as robots are often associated with dystopias of what a jobless future could bring (some research suggests that 50% of all human jobs are threatened to disappear due to automation within the next 20 years). At the same time, robots are also imagined as providing a solution to shortcomings in the healthcare sector that will be increasingly stretched thin as populations grow older, as well as contribute in dangerous, dull and dirty tasks. We will see robots in the context of Scandinavian welfare states, with loing traditions of involving workers in the formation of their work situation, relatively high wages and levels of automation of work tasks, and use this geolocation to explore how such a region is adopting robots.

On the Triple Construction of Robots, Human and Society in the Robotocene *Dazhou Wang, School of Humanities and Social Sciences, University of Chinese Academy of Sciences*

The expression of the robotocene captures the configuration of contemporary social-technological change. The author clarifies four types of the robot discourse: (1) replacement discourse (human beings has been deprived of their works or replaced by the robot in certain workplace, including those in harmful environment); (2) assistant discourse (the robot can be assistant to human being especially those disabled persons, senior citizens, and children, etc.); (3) enhancement discourse (the robot can be used to enhance human life, even can be a perfect partner, so as to bring brand-new life experience to human being); and (4) alienation discourse (the robot will be an autonomous agent to get out of control which will result in the Frankenstein effect). All of the discourse involve ethical, social and legal issues, and in general seems to necessitate enhancement of human being herself, and improvement of the governance structure of human society. It is argued that the human being has to be re-intelligentialized to match the power of intelligent robots as well as the complexity of this increasingly intelligent world. This kind of match has two aspects: One is the match in that we need to be equipped and empowered with the intelligent devices in order to protect oneself without being harmed by the robot and other technologies; The other is the match in that we can build-in the capacity to help us to establish more convenient dialogue relationship with the robot and other agencies so as to better understand and adapt to the intelligent environment around them. This can be done by a variety means including development of the embedded technologies and new mediated technologies. Whatever the means are, only if this match be achieved, can the human being win the freedom in the robotocene. Indeed, the history has approached to a point where the human being should not only use technology to cope with the natural force, but also use technology to cope with technology, and finally to transform themselves and the society through technology. In this way, the property exchange between human, technology, and social structure is inevitable, and the new distribution mode of responsibility is constantly brought about. In short, we need the triple construction of the robot, human being and the society, in order that we can have an acceptable and desirable robotocene.

Reprogramming the Future in China: Robot Revolution *Daria*

Savchenko, Harvard University

My talk and paper will be based on the ethnographic work on educational robotics for young children that I did in 2016 in Shanghai, and future fieldwork in a robot museum and household use of robots in China. In the context of China, the main narrative, as exemplified by the state-run Chinese media, is that China is in the process of leaving behind its economy, based on mass manufacturing, in order to leap to its high-technology future: robots are becoming a more and more frequent device, both rhetorical and mechanical, used to achieve this leap. China, both in commentary on its own economy and in frequent, sometimes nationalistic comparisons with Japan and the United States, aspires to be different and better, more advanced technologically; the image of robots becomes an instrumental component of these dreams of supermodernity. I would argue that a robot, both as a discursive formation and as a powerful primordial, transcendental, and future-oriented teleological body, is a figure working in new ways in governmentality. In my talk, I will focus on the mechanisms of how robots work in governance. Moreover, I will try to disrupt the substitutability thesis that gets often employed when talking about robots and humans.

Algorithmic Care in the Robotocene: a Case Study from Japan *Adrian James Wright, University of Hong Kong*

Long considered an innately human, labour intensive activity not easily amenable to automation, care is becoming robotic. Over the past two decades, the Japanese government has been spending billions of yen on the development and implementation of various national and regional robot care projects. Developing such robots involves a process of "artificial anthropology" (Dumouchel and Damiano 2017), with engineers first constructing a standardised, algorithmic understanding of elderly care, and then materialising this knowledge in the form of robotic analogues which are designed to carry out each of the discrete tasks that supposedly make up care. This paper aims to explore this process of roboticisation, following Japan's largest national robot care project from the development of care robots through to their implementation at a nursing home. Data was gathered over 15 months' of multisited ethnographic fieldwork at Japan's National Institute of Advanced Industrial Science and Technology and at a public elderly nursing home in Kanagawa, where three care robots (Paro, Pepper and Hug) were introduced. This data is used to analyse both the material practices and ideological inscriptions involved in producing and staging the robots, as well as how these devices were adapted, modified, accepted or rejected in actual use by carers. The aim is to contribute to wider debates in STS about roboticisation in practices of care and in other labour-intensive service industries, with a particular focus on temporalities of care and Judy Wajcman's concept of "time shifting" (Wajcman 2015).

Future Bodies: Telepresence Robots and Remote Collaboration *Andrew Glover, RMIT University*

Telepresence robots – wheel based devices equipped with a screen, camera and microphone that can be controlled remotely to move around a physical space – are increasingly being used to achieve a 'presence' in professional and domestic settings in the absence of corporeal mobility. From roving airport 'helpdesks', to

working from home, to academic conferencing, telepresence robots give us a glimpse of what the 'Robotocene' might look like in the future. Drawing on ethnographic observations from attending academic conferences, workshops, reading groups, and other events via a telepresence robot, we conceptualise this arrangement as a digitally mediated extension of the body that – in contrast to standard video conferencing formats – enables certain practices of interaction and collaboration that are contingent on bodily co-presence. We explore how the telepresence robots experience creates opportunities to forego air travel, which is a significant and growing contributor to climate change. How does this technology force us to reconsider our relationship to physical space? And how does our animation and inhabitation of these robots differ from other 'smart' robotics? As the technology matures and the experience of 'being there' becomes more immersive, how will we learn to live, work, and play with 'roboticized' versions of each other in the future?

Session Organizer:
Roger Andre Søraa, NTNU

023. Flammable Futures: Encountering Combustion in a Changing Climate 1

Papers for Open Panels/Flammable futures: encountering combustion in a changing climate
Open Panel
9:00 to 10:30 am
ICC: E5.3

There are growing signs that the incidence and severity of wildfires are increasing due to climate change. This issue is compounded in many fire-prone countries – including Australia, Chile, Canada, Portugal and the US – by increasing enclosure within forest interfaces. Such trends not only raise questions about the sustainability of life in the spaces where 'fuels' and human populations intermingle but also, more broadly, how we should coexist with combustion on an increasingly flammable planet. Humans have 'appropriated and advanced a technics that was the planet's own,' as Nigel Clark notes, forcing global changes through a capacity for combustion. In line with STS's commitment to understanding science and scientific knowledge as situated, this panel seeks contributions that consider how our knowledge of combustions' present and future are being assembled. Possible topics include: combustion and markets; quantifying combustion; cultures of combustion; distributing combustion risks; and, the biomedical consequences of combustion. This raises a broader set of questions about how our lives are entangled with these and other combustive practices that condition the planet's flammability. For proof of these entanglements we might look not only to the ongoing extraction and consumption of fossil fuels, but also the broad-scale fires intentionally lit by agriculturalists to aid food and commodity production. We might look, more microscopically, to the carcinogens that various combustive arrangements sediment into our lungs and bloodstreams. Linking all of these concerns is the question of how combustion is rendered discursively and materially containable.

Participants:
Fire as Companion Species: Speculative Futures in Fire Ecologies and More-Than-Human Relationalities in a Changing Climate *Aadita Chaudhury, York University*
Fire has a crucial role in human and environmental history. Invoking Donna Haraway, one can appreciate fire as "companion species", yet its unpredictability has obligated humans to discipline their bodies and affairs in a way to reap its maximum benefits while eluding its danger. In recent years, massive wildfires have spread across vast swathes of land in North America, Europe and Africa, wreaking havoc in residential, agricultural and forest lands. Many researchers predict that such large-scale wildfires, termed megafires, will become more frequent as global climate patterns continue to change (Wang et al. 2015). Wildfires are potent ephemeral, translocal and generative phenomena that are sites for organic and material life and death of both the human and the nonhuman – a dynamic being in its own right. This paper seeks to disentangle tensions at the intersection of more-than-human relationalities, death and belonging in the era of rapid environmental and social change, through the lens of fire ecologies. I investigate the ways by which humans and their transient more-than-human relationalities might find belonging and security in the so-called Anthropocenic fires where through annihilation and regeneration, everyone is returned home, literally and figuratively, into the ecological networks that once sustained them. I argue that fire is the "companion species" that facilitates such transformations. I speculate how such megafires may impact these dynamic relationalities and their futures, while looking to sociocultural and artistic responses to such events as a means to world-making and developing new ways of being in the Anthropocene.

Right Fire, Wrong Fire. Burning together with Country, evolving our culture with fire. *Den Barber, Koori Country Firesticks Aboriginal Corporation; Lauren Tynan, University of New South Wales; Michelle Bishop, University of New South Wales; Jeremy Walker, University of Technology Sydney*
The question of our responsibilities toward the Earth and each other is intimately bound to our cultural relationships with fire. We might contrast two pyro-cultures, or pyro-technologies. First, the Aboriginal / Indigenous knowledge practice of caring for Country with cool burns which 'trickle through the country like water', currently undergoing a renaissance. Second, the mainstream European / industrial culture, which either represses fire in the landscape or burns 'fuel load' hot for 'hazard reduction', with often disastrous consequences for ecological communities. Then there is the enormity of industrial fire, burning much of modern material culture into being. Mainstream political institutions have sought continually to expand the combustion of mined fossil energy in enclosed motors, power stations and materials processing. The global warming caused by industrial fire is increasing frequency of 'catastrophic' heatwaves and fire conditions over the Australian continent. From the point of view of Indigenous country keepers, our responsibility to heal Country and take responsibility for the 'flammable future' requires a decolonisation of mainstream pyro-cultures and land management regimes. Uncle Victor Steffensen, who works to pass on fire lore from Kuku Thaypan Elders of Country (Cape York) to Countries in the South, argues that "There needs to be a cultural shift. We need to evolve our culture with fire" (SBS Insight 16 Feb 2016). In this presentation, we would like to share our experiences as Firesticks practitioners, opening the question of how we might collectively 'evolve our culture with fire', from the deep past into the

future to come.

Letting it Burn: Contesting 'Value' and Expertise in the Canadian Boreal Forest *Alex Zahara*

Over the last several decades, wildfire management in Northern Canada has become an important and controversial issue. In northern Boreal Forest regions of the province of Saskatchewan, wildfires are increasingly impacting the lives of the region's primarily Indigenous (Dene, Métis, Rocky Cree, Swampy Cree, and Woodland Cree) residents. In the last 5 years, Northern lobbying and protest groups have formed as a response to the province's so-called 'Let it Burn' policy. Though not an official policy, the practice began in the early 2000s as a response to environmental concerns associated with centuries of fire suppression, and involves allowing wildfires to burn until they approach something of social or economic 'value'. Though framed by wildfire managers as a measure necessary for promoting northern 'sustainability', many locals argue that the policy is a direct affront to Indigenous sovereignty, leading to increased community evacuations, loss of territory, and routine smoke exposure. While numerous studies have focused on the effects of wildfire management practices on Northern Indigenous communities, this paper 'studies up', examining the contemporary policies and practices that make up the province's 'Let it Burn' policy. Through archival research and interviews with northern lobbyists and wildfire practitioners, I showcase how public controversies regarding wildfire management are often framed by settler governments and media as an issue of scientific versus Indigenous knowledge. Drawing on Indigenous and feminist STS, I argue against this (colonial) framing to showcase how local practitioners are actively engaged in efforts to create an anti-colonial risk management science.

Making Live on Landscapes That Die: Prescribed fires in Canadian national parks *Colin Robert Sutherland, York University, Canada*

Prescribed burning is often positioned as a much needed form of land care in Canadian national parks, where diverse fire-prone ecosystems have suffered at the hands of a century of fire suppression. Suppression policies, which replaced and helped actively erase diverse indigenous relations to fire, remain the status quo. Today, though suppression still reigns supreme, fire managers, ecologists, and municipalities are grappling with the increasingly complex task of putting fire back on Canadian landscapes. Based on an institutional analysis of Canada's national park fire program, this paper will consider the work and diplomacy of suppression and ignition on landscapes that burn. Though attuned to the particular and unwieldy agency of combustion in different ecosystems, fire managers and ecologists work towards 'returning' fire to the land in the hopes of caring for fire-dependent species and producing more natural landscapes. This process is often complicated by the mosaics of governance often surrounding national park land, and the internally competing national park mandates, like that of tourist revenue and protecting 'species at risk' (not all of which benefit from fire). In an institution tasked with caring for the 'ecological integrity' of national park land, managers and ecologists are tasked with making sense of competing projects to 'make live' (Lorimer, 2015; Braverman 2015) in landscapes that

periodically die. This paper will consider the work of carrying out a prescribed burn in complex policy landscapes punctuated by conflicting visions of what it means to flourish.

Session Organizer:
Timothy Neale, Deakin University

Chairs:
Lauren Rickards, RMIT University
Timothy Neale, Deakin University

024. Beyond Boundary Objects and Immutable Mobiles - New Ways of Thinking about the Movement of Knowledge I: Theoretical Perspectives of Knowledge

Papers for Open Panels/Beyond boundary objects and immutable mobiles: new ways of thinking about the movement of knowledge Open Panel
9:00 to 10:30 am
ICC: E5.4

Knowledge has been a central focus in Science and Technology Studies for quite some time, in particular its production and dissemination. To talk about the latter, STS scholars have developed concepts like boundary objects, immutable mobiles, and trading zones; concepts that draw attention to the knowledge objects that offer flexibility or stability or are being exchanged. This open panel explores new and other ways of in detail tracing the everyday practices, structures, and relations that make knowledge travel from one site to another. This session adresses important theoretical perspectives of knowledge.

Participants:

Hot Air and Hype? The Work of Events in Translating Socio-technical Imaginaries of Big Data *Michael Hockenhull, IT University of Copenhagen*

This paper examines commercial and technology events in order to understand what work these perform to translate knowledge and socio-technical imaginaries of big data. Based on a multi-sited ethnography of events, such as after-work meetings, workshops, conferences and interviews with participants, the paper argues that industry and interest-group events play an important function in translating knowledge of big data into local contexts. Rather than dismissing these events as merely 'hot air' and 'hype', it is suggested that the events provide important avenues for building and sustaining certain socio-technical imaginaries of what big data is and what its importance should be. These imaginaries form part of the basis for further organisational action concerned with big data. The paper thus explores the idea that events and the organisations that host them can be thought of as a sort of infrastructure for the production and circulation of not only hype, but also relational work, instructions on funding opportunities, promotion of technical standards and techniques for data work. Events stand apart from everyday organisational work yet are designed to be valuable to it. They act as an obligatory passage point for actors seeking to understand new phenomena or interface with other actors and their organisations. The paper makes an empirical contribution to understanding the translation of knowledge and socio-technical imaginaries of data, both between organisations but also across nation-borders. The paper explores the well-developed STS concept of infrastructure as a theoretical lense for understanding these activities.

Where Everyone and Everything is a Boundary Object *Yasunori Hayashi, Charles Darwin University*

This paper begins with an ethnographically self-reflective analysis triggered by a social scientist addressing the presenter (me) as a boundary object. I was at the time translating and facilitating interaction between Yolngu Indigenous Australian landowners in East Arnhemland in the Northern Territory, and practitioners of Western scientific knowledges—both natural scientists (hydrologists) and social scientists. We are all participants in a current Australian Research Council project – 'Cross-cultural management of freshwater in the Milingimbi community' http://groundup.cdu.edu.au/index.php/cross-cultural-management-of-freshwater-on-resource-constrained-islands-arc-linkage/ This story is a case study to empirically and intellectually situate the presenter (me) as a boundary object – an 'object' that mediates between two knowledge communities. Then I highlight a core Yolngu epistemic practice, introducing gurrutu (kinship) in which everyone and everything is a boundary object by virtue of being a relation. An allegory galimindirrk (brackish water) - a favoured Yolngu metaphor re-presenting the idea of joining differing life-sources, will exhibit how Yolngu do differences together within a collective matrix of boundary objects. I will then explore what STS academics might learn from the Yolngu epistemic enactments in everyday and ceremonial contexts. I hope this might lead academics to reconsider boundary objects in new and different ways when thinking about the movements of knowledge.

Digitising Language Practices - Boundary Objects in the Movement of Knowledge *Cathy Bow, Charles Darwin University*

This presentation details two digital infrastructures presenting Indigenous Australian language materials - the Living Archive of Aboriginal Languages (containing digital versions of books created for bilingual education programs, available at http://livingarchive.cdu.edu.au/) and the Digital Language Shell (an online template for sharing Indigenous languages and culture, available at http://language-shell.cdu.edu.au/) - which I have worked with and helped to develop over a number of years. Reading these as boundary objects, I consider how these infrastructures support and facilitate the movement of knowledge between Indigenous and non-Indigenous creators and audiences. Part of this involves considering how the infrastructure networks of software, web design, language data, digital objects, books, curricula, etc., reconfigure existing knowledge artefacts into digital formats, which then take on new performativities in the online space. I will also consider how such re-presentation of language practices in the digital realm may shape and problematise certain issues, both enabling and restricting the movement of knowledge between very different knowledge traditions. Drawing on stories from users, I begin to consider and open up some of the means by which these infrastructures promote transitional language work, and might continue do so in more explicit and informed ways.

User-Generated Content as a Sandbox for STEM Education *Rich Gazan, University of Hawaii*

Meaningful STEM education is not simply memorizing and applying facts. It requires understanding the processes of scientific inquiry and the conversations and controversies surrounding those facts, an STS-oriented approach that aligns well with both science education

standards and STEM learners' actual practice. We discuss the initial results of a series of studies of STEM learners' evaluation and use of alternative knowledge sources to supplement traditional, syllabus-based works in formal STEM education. A 2013 study of 28 million course papers submitted to the Turnitin plagiarism detection site reported that social networking, online Q&A and other user-generated content sites were cited in 23% of the papers written by students in higher education institutions. While instructors and librarians actively steer students away from these non-authoritative sources, there is an argument to be made that their interactive, formative and multi-vocal nature mirror the non-linear, contested messiness of science itself. They provide a forum for STEM learners to interact, question and evaluate propositions among peers, in much the same way scientific knowledge claims are constructed and debated. Understanding how students perceive, evaluate and integrate alternative resources into their coursework provides a needed counterpoint to traditionally authoritative STEM learning resources, demonstrates the need for updated and merged science education and information literacy standards, and may help increase student engagement and persistence in STEM fields.

A Non-Representational Description of the Craft Practice of Wire-Bending *Vernelle A Noel, Georgia Institute Of Technology*

In this paper, I describe wire-bending using a non-representational approach that is concerned with practices; material objects; and the body (Thrift 2007; Vannini 2015). "Practices" are defined as material bodies of work through corporeal routines, actions, and devices; "material objects" as the results of our perceptions and embodied experiences; and "the body" as the body's interactions and relations with other things. I describe wire-bending through three lenses: its sociality; corporeality; and materials and materiality. Sociality is characterized as the communal aspects around wire-bending; corporeality as the physical body in relation to, and in conversation with things and materials as wire-benders perform wire-bending; and materials and materiality in terms of the materials' purposes, properties, qualities, and performances. This rendering of the sociality, corporeality, materials and materiality of wire-bending enlivens it. No longer is it simply "wire and other thin, flexible strands of material bent with hand tools to create 2D and 3D structures," but instead it is a milieu of interactions between community, senses, and the moving body, sculpting, painting, and drawing with static and dynamic linear materials for concurrent expression of each in three-dimensional space. This new definition acknowledges the rituals and entanglements embedded in wire-bending.

Session Organizer:
Jenny Gleisner, Department of Thematic Studies - Technology and Social Change, Linköping University

025. STS Underground: Fieldnotes from the Pre-conference Workshop
Papers for Open Panels/STS Underground: Investigating the Technoscientific Worlds of Mining and Subterranean Extraction Open Panel
9:00 to 10:30 am
ICC: E5.5
This is one of three panels bringing together international scholars

whose work addresses technologies, practices, and forms of knowledge related to the subterranean, including the mining of minerals, groundwater and fossil fuels. This session explores the themes and experiences that formed the pre-conference workshop "Making Meaning of the Underground".

Participants:

Going Deep: Emerging Methods for Studying the Underground in STS *Abby Kinchy, Rensselaer Polytechnic Institute*

Underground spaces and places are difficult to see, explore, and develop, making them sites of speculation and persistent unknowns. This makes the underground a particularly intriguing site for social studies of science and technology, and both knowledge and ignorance about the underground have attracted the interest of STS scholars working in variety of theoretical and disciplinary traditions. However, studying human interactions with subterranean materials and places poses methodological challenges. How do we observe and analyze what is often an absence of knowledge and experience of the underground? The aim of this presentation is to explore the research methods and analytical strategies that STS scholars have used in work dealing with the underground. In particular, this talk will highlight the work presented at the STS Underground Workshop that will take place in advance of 4S Sydney, which is organized around methodological questions and practices of engagement. The workshop continues a discussion about the unique perspectives and ideas that STS scholars bring to studies of mining, underground exploration, burial, and extraction. This conference presentation will serve as a report-back on the ideas emerging from the STS Underground research network to the larger 4S community.

How and Why Cave Explorers Blast and Dig Underground Passages: A Comparative Perspective Across the USA *Maria Alejandra Perez, West Virginia University*

On July 14, 2012, a group of cavers (cave explorers, a.k.a. spelunkers) made an extraordinary discovery. They broke into what appeared to be a massive cavern in Greenbrier County, West Virginia. They did this, however, by digging down a plugged sinkhole with a rented Caterpillar 312B on the land of a farmer, who eagerly cheered on. Hand digging followed, aided by a technique called Micro-BlastingTM. As of this writing, the discovered cave system, known as Savannah Cave, has over a mile of explored and surveyed passage, with potential for more. The fact that cavers dig and blast to discover caves and push passages is controversial. In many ways, these practices defy the idea that caverns are natural phenomena. Some raise conservation concerns. Others dismiss it as unethical. Yet others insist that without it, critical karst resources would go unexplored and undocumented and thus risk not being conserved at all. New tools (such as Micro-BlastingTM) and presumably more pressure to locate so-called virgin passage in areas with long histories of exploration appear to be increasing the frequency and intensity of cave digging projects. This paper examines the history of this trend and current practices in the USA. Cave digging takes on different characters depending on the property regimes that govern underground access and exploration in different parts of the country. A broader historical view of human modification of karst environments provides context to this research.

Machinery, memories, matter: The techno-geological worlds of small-scale miners in Bolivia *Andrea Marston, University of California, Berkeley*

Drawing on ethnographic fieldwork with small-scale tin miners in the highland Bolivia, this paper explores subject formation in underground spaces with an attention to the interactions of geological materiality, extractive technologies, and labor. Deep inside a mountain that was once the most productive tin mine on earth, small-scale miners use a combination of manual and semi-industrial tools - many inherited from the now-shuttered state mining corporation - to follow veins of tin no thicker than a fingernail. For Bolivian experts, including political economists and mining engineers, small scale miners' methods, tools, and (lack of) future visions render them evidence of temporal regression, a "return" to colonial times. For the miners themselves, however, the meanings attached to the rusty machines, underground work, and the metal itself make them privileged national actors - more "Bolivian" than others. Contrasting these perspectives, this paper shows how the miners, composing a truly "geosocial" formation, are shaped in relation to technology and the geological worlds in which they labor.

New Energy Spaces; Energy From Magma And The Krafla Magma Testbed *Alexandra Gormally, Lancaster University, UK*

This work moves beyond conventional discourses on energy and the subsurface and considers the role of new geological spaces and how they might challenge our current framing of energy transitions ahead. Inparticular it considers a new speculative geological energy resource – that of energy (electricity) from magma (Elders et al., 2014). A cutting edge and exploratory programme of research is currently underway at Krafla, a volcano in Northern Iceland, with a number of other possible sites emerging globally. These include New Zealand where a grant has just been awarded, with further exploration in Mexico, Japan, Russia, Kenya and the US. Krafla is now seen as a pioneer site for this emerging `science infrastructure` and subsequently named the Krafla Magma Testbed (KMT). The KMT project gives us unprecedented engagement with magma and yet also provides huge uncertainties about the outcomes, findings and risks (Clark et al., 2017). This work considers how this emerging new energy space challenges our conceptualisation of (clean) energy production given it's potential for utilising powerful geothermal energy, at scale, from a renewable resource. It also raises questions as to how energy from magma fits into our existing socio-technical framings of what a future energy system should be, and the implications of its emergence for future governance (Cherp et al., 2011). Here I will present the initial findings of an empirical scoping study carried out at Krafla, in May 2018. Themes explored include, the role of different geological knowledge (expert, local) and the framings of risk and responsible innovation.

What does extraction mean for the urban form? *Vanessa Lamb, School of Geography, University of Melbourne; Eli Asher Elinoff, Victoria University of Wellington*

Sand mining is a global US$70-billion industry. It is "the global environmental crisis you've probably never heard of"[1]with considerable media attention to sand mining in Asia over the past year. This work reveals large volumes

of sand being extracted to produce concrete and fill, and to export sand across borders, particularly to build the Asia's cities. Alongside, karst mining for limestone and other aggregates, environmental issues surrounding these forms of extraction draw mass urbanization together with contemporary concerns over mining extraction in particularly stark ways. We present fieldwork from across sites of sand extraction (Myanmar) and site of urban development and concrete production (Thailand) to reflect upon the differential challenges in studying the materials that comprise the very foundations of the urban form. Such an engagement does not simply reaffirm the planetary quality of contemporary urbanization (i.e., Brenner and Schmid 2015), but refocuses our understanding of urban expansion upon environments and environmental struggles distributed across vast geographies This 'telecoupling' of sites of extraction and development reveals how urbanization draws together places, histories, and politics across long distances revealing both possibilities and challenges for understanding and confronting the harms associated with extraction. Nevertheless, we show how such processes are necessary for understanding 'the ground' we walk on. 1. Beiser, V. 2017, Feb 27. Sand mining: the global environmental crisis you've probably never heard of. Guardian.

Session Organizers:
Roopali Phadke, Macalester College
Abby Kinchy, Rensselaer Polytechnic Institute
Chair:
Matthew Kearnes, Environmental Humanities Progarmme, School of Humanities and Languages, University of New South Wale

026. COMPOSTING Feminisms and Environmental Humanities 1: Decolonising Naturecultures
Papers for Open Panels/Composting Feminisms & Environmental Humanities
Open Panel
9:00 to 10:30 am
ICC: E5.7

Imagine the process of reading and writing as composting. Matters break down and re-emerge as new matters. In the spirit of a feminist politics of citation, how might we attune ourselves to the ways in which new ideas are always indebted to writings, readings and practices that have come before? What and how are feminist genealogies composted in and through the Environmental Humanities? What concepts are especially fruitful, and why? In what forms do these ideas re-emerge? How are these genealogies acknowledged? What ideas are yet to be added to the Science and Technology Studies (STS) compost pile? Composting, as a feminist practice, has been taken up by a University of Sydney-based reading and research group of cross-institutional, trans-disciplinary scholars exploring the traces, legacies and intersections between inclusive feminisms and broad Environmental Humanities. Started by Dr Astrida Neimanis and Dr Jennifer Mae Hamilton in September 2015, the Composting Feminisms and Environmental Humanities group wishes to connect with transnational composting kin through this open panel at 4S. STS & Environmental Humanities share many key feminist interlocutors and this panel is an opportunity for discussion of similarities and differences.

Participants:
Can untangling globalised plant stories help us to compost and

compose decolonisation? *Emily Crawford, Composting Feminism*
This paper explores the role of narrative storytelling and multispecies ethnography in the Environmental Humanities, focusing on one particular species of plant made nomadic during colonial seed scattering. Traversing from the initial sites of colonization in South Africa, the Cape of Good Hope, to the first sites of colonization in Australia, New South Wales coastline areas such as Kurnell, Bitou Bush (Chrysanthemoides monilifera) has become much more than just an aesthetic botanical background in surprising ways. I found that for this plant protagonist, the borderlands of systems of valuing have shifted over time and remain in a state of flux. In an attempt to unsettle borders engrained by lingering colonial histories of classification, I argue that by focusing on these particular plant histories and their wider cultural contexts, we might re-write plants as key actors with agential capabilities, helping to shape history and culture using vastly different sensory dexterities. Weaving through fieldwork along the NSW coast I found that these particular histories and present entanglements between humans and plants hold the seeds of more respectful and collaborative approaches to our relationships with plants and other-than-human, as well as between human communities in various ways. Hopefully, it looks for decolonized ways to engage in collaborative work with plant assemblages in the 'bush' in NSW, developing the notion of 'compos(t)ing decolonization' in human-plant contact zones.

Valetudo: a cultural anti-venom approach *Nancy Mauro-Flude, RMIT*
Known as the "citizenship seven" case, in 2017 the Australian High Court ruled many Australian MPs ineligible to sit in parliament, this unfolding citizenship crisis allowed for radical constructions of (Australian) subjectivities to emerge. Many more citizens now can more fully understand the nationhood as a precarious, contested state, which also presents fresh opportunities to develop a more critical transnational consciousness. With this in mind, this paper considers the particular Tasmanian predicament, drawing upon case studies of cultural manifestations that have attempted to address the hackneyed post-colonial scenario of the Island state (Tasmania). That is, Tasmanian Aboriginal politics - the ongoing dispute about who actually qualifies as and who determines (Palawa) aboriginality. Reaching beyond politics, this inquiry instead points to how a deeper engagement with such issues of nationality can occur through the examination of cultural practices. This analysis reflects on the problems and possibilities of the 'postcolonial archive' (Shetty and Bellamy 2000, after Spivak 1988), a concept that has yet to be widely taken up in STS in regard to twenty-first century artforms and culture. Case studies examine specific cultural instances that have either manifested and triggered debates, for instance; the Aunty Ida West Healing Garden at Wybalenna on Flinders Island in Bass Strait (2004), Aboriginal DNA Test performance installation (2014) at the Museum of New and Old Art, MangoGate (2017) among others. Drawing upon and adding to experimental ethnography, theory, and STS Methods suggested by Fisher (2018), this paper sheds an array of critical viewpoints allowing us to speculate future possibilities.

Ecological perceptions: new growth from the soil of environmental knowledges in Oceania *Rachel Morgain, Fenner School of Environment and Society: Australian National University*

Over the past five decades, the 'ecological' has transformed itself within Anglophone settler colonies from a scientific concept to a widespread imaginary anticipating human-beyond-human relations in a (hopefully) more just world. The naïve optimism surrounding early feminist attempts to engage with the ecological has long since given way to a critical post-humanism embracing partiality, troubled affect and the becoming of incompleteness. But where do scientific models of ecology fit with this post-humanist materiality? Must we wholly reject the emphasis on management, planning, testing, counting and statistical knowledge as effacing affect and reproducing colonial and masculinist dominance? How can we talk affect and statistics in polyphonic sympathy? And how can decolonizing knowledges further trouble our current settlements of knowledge of human-environment, nature-culture? Drawing on observations, reflections and knowledges from Australia and the Pacific, this paper will attempt to traverse meaning, affect and possibility in 'ecology' as a modest step towards growing new practices from the fertile soil of recomposed ecological sciences, decolonising Pacific knowledges and anti-colonial feminisms.

Placenta To Go: Transcultural Birth Practices and Embodied Ecologies *Kara E Miller, California State University, Long Beach*

The proposed piece utilizes radical new ecologies to explore cultural terrains of placentas and offer theories of dispossession from biopower. Based in ethnographic research with rural, indigenous midwives in Southern Uganda from 2010-2017, as well as anecdotal evidence from Los Angeles, CA, I consider where this life-generating organ is imbued with vast spiritual significance versus where it is bio-waste to be incinerated. The placenta is central to many indigenous systems of medicine and increasingly harnessed in spheres of mindful and alternative medicine. I re-conceptualize vitality in terms of self-formation, and move frameworks from productivity and labor to re-creation in an unfurling world capable of self-harmonizing. Placentas are buried in the earth and made into foods and medicines because of what they offer hormonally, nutritionally, ancestrally, and symbolically. With vast implications for theories of new materialisms and vibrant life as well as parallels to the human quest for self-sovereignty, I offer an exposé on generativity by way of the placenta. I look at the placenta as a way to approach a reclaiming, re-naturalizing, and re-wilding of physiologies that decolonize the flesh with possibilities to re-inscribe our understandings of the body through feminist lens. The placenta is an agent of self-reliance, and this takes on particular meanings in precarious and violated regions of the world, which I address with regard to survivalist ethos from the anthropocene as well as environmental humanisms. I ask how the placenta and the edible, cyclical body can reimagine the medical body with enfleshed understanding and perceptive narratives.

Session Organizer:
Lindsay Kelley, UNSW Art & Design

Chair:
Susanne Pratt, University of Technology, Sydney
Discussant:
Jennifer Mae Hamilton, Unversity of New England

027. Science, Technology, and the Regulation of Food and Agriculture #1
Papers for Open Panels/Science, Technology, and the Regulation of Food and Agriculture
Open Panel
9:00 to 10:30 am
ICC: E5.8

Food and agricultural production have long been shaped by scientific and technological innovation. Technologies designed to increase crop yield, produce novel traits, maintain biodiversity, and improve the global transport of goods significantly transform the food ecosystem from production and processing to transport and consumption. Simultaneously, these transformations prompt new regulations that often evoke broader ethical concerns about the future of food. Today, almost every technological innovation in food involves some type of novel regulatory response. These regulatory interventions not only shift how people access, interact with, and understand food, but also iteratively transform the spaces in which techno-scientific innovation takes place. This panel explores how the science of food and agriculture intersects with emergent regulatory regimes. Regulation may refer specifically to the law and its application, but might also encompass the institutional practices that shape scientific research, the organization of agricultural production, or the socio-cultural norms that determine what foods can or should be eaten. Some of the questions that might be asked include: How has intellectual property – from patent and plant variety protection through to trademark and trade secret law – reconfigured contemporary food production? How are foods categorized, packaged, and labelled, and how do those regimes shape the materiality of the food itself? What do new developments in biotechnology and gene editing mean for key regulatory food categories like 'GM' or 'organic' food? What resources are available for local communities to resist or reconfigure the regulatory landscape in a manner suitable to their divergent needs?

Participants:

Making Legal Space for Food: Science, Safety and Regulation Through Food Sovereignty Ordinances *Amy Trauger, University of Georgia*

The Local Food and Self Governance ordinances developed by farmers and activists in several townships in the American state of Maine revolutionized food and agriculture social movements in the United States. The ordinances exempted food production and distribution from state and local regulation on the basis of autonomy under "Home Rule" governance characteristic of the region. The ordinances were developed as a response to new state-based food safety regulations that imposed a one-size fits all rule on small and large farms alike. The new regulation specifically impacted chicken processing and raw milk sales that up until 2009 had been relatively unregulated and thus legally regarded as "safe" by local and state authorities. The food sovereignty ordinances failed in the short term due to its reliance on local rights to govern. In the United States, the commerce clause, which establishes the supremacy of the Federal government over states and cities, exists to effectively pre-empt the local governance of trade, even in "Home Rule" states. Thus, the demand for rights to govern is

always at risk for failure, and vulnerable to states of exception, without the creation of political spaces at (multiple) spatial scales often below and beyond the reach of the state. I position these politics within the narrative of insurgent or "agrarian" citizenship, which places its allegiance with nature, community, and "life itself" rather than the state and discuss what possibilities exist to protect rights to food.

Reimagining the Natural in the American Food Industry *Ai Hisano, Kyoto University*

Food coloring has been a common practice across cultures for millennia, at least since ancient Egyptians used saffron to color various foods. Beginning in the late nineteenth century, with the extensive industrialization of food processing and agriculture, the coloring of foods became a crucial part of manufacturing and marketing strategies for food businesses. While the manipulation of color is still a significant practice in the food industry today, however, the management of color has become more challenging for food businesses. This paper explores how food processors sought to manage the color of foods from the 1980s to today when public concerns over the use of food dyes and health risks increased rapidly. By analyzing the expansion of the food coloring business and the establishment of government policies on food safety, the paper shows the political and social consequences of food coloring practices and regulation. As the use of food dyes increased, consumer activists and government officials began questioning the safety of coloring foods and revisited the issue of the naturalness of foods. While advocating the use of "natural dyes" derived from plant-based substances instead of chemically synthesized dyes, consumer activists continued to accept the coloring of foods. The upshot was that food manufacturers, consumers, and legislatures reinvented the concept of naturalness. This did not mean a reversion to the past, but rather a re-imagination of the natural in the context of highly mechanized manufacturing processes and advances in modern science.

The Sense in Consensus: Sensory Platforms for Horizontal Decision-making and Leadership in Radically Democratic Environments *James Debowski, College of Arts and Social Sciences, Australian National University*

While horizontal decision-making and decentralized leadership have become entrepreneurship buzzwords, the concepts are deeply rooted within political movements advancing radically democratic futures and alternatives. In this presentation, I reflect on the role the senses play in horizontal decision-making and decentralized leadership in such environments. Particularly, I draw on 16 months of ethnographic fieldwork, focusing on decision-making and leadership within an illicit brewing cooperative in Catalonia. This cooperative exists within an emergent industry of illicit manufacturers promoting self-management, cooperation, and solidarity in a strongly left-libertarian and anarchist field. Bodily experience is central to brewing: from building flavour profiles, aroma, and mouthfeel to passing grist through one's fingers and tweaking procedures for ambient conditions. Although standardization and routine tests now stand in for many sensory assessments, the embodied experience remains fundamental. These experiences however are fraught with difference and tension when undergone collectively. At the junction between the embodied and the political, I

examine how actors navigate such differences in the pursuit of democratic decisions – how they negotiate the senses within consensus. Building from a focus on sense and affect, this presentation offers insights for advancing democratic decision-making and leadership. I argue that workers embrace a decentralized and affective approach towards leadership and decision-making, drawing on interpersonal ties and shared political visions to resolve differences. However, intersections between the sensory and the consensual can generate powerful tensions. I demonstrate that within this setting, responses to taste (in particular) have conflicted with democratic practices, often with intriguing results.

Who Has Voice in Decision-Making About Emerging Technologies? Examining Influence in the Regulatory Review Process *Teshanee Williams, North Carolina State University*

Genetically engineered salmon have been approved for human consumption in the United States (US) and Canada, but it has only been released for sale in Canada. In the US, the debate concerning categorization, labeling, and materiality continue in tandem with conversations related to definitions of risk and the appeal for meaningful democratization of the regulatory review process. The US Food and Drug Administration contends that risk assessments for emerging food biotechnology should be based on objective, "pure-science". Opposition to the "pure-science" approach has been described as emotion and dogma that fails to provide scientific facts. Still, completed risk assessments fail to address all of the scientific concerns, suggesting the presence of "epistemological dogma" in the decision-making process. This presents an opportunity to explore narratives that are being used to influence decision-making and those that are not. To this end, this study has two goals: (1) to explore narrative elements and narrative strategies used in the regulatory review process to develop regulations for food-biotechnology, and (2) to examine how narrative strategies are used to reinforce and shape the regulatory guidelines for food-biotechnology now and in the future. To accomplish this goal, this study employs content analysis guided by Narrative Policy Framework and insights from the cultural cognition of risk theory. Data will be taken from public comments and public and congressional hearings. Preliminary findings suggest associations between specific narratives and certain cognitive biases: confirmed through interrater reliability. This research offers practical guidance for science communication and for understanding how groups can become engaged to reconfigure policy outcomes.

Regulatory Responses to New Plant Breeding Techniques *Karinne Ludlow, Faculty of Law, Monash University*

Genetic variation in plants is fundamental to food security. New plant breeding techniques, such as genome (or gene) editing using site-directed nuclease (SDN) techniques including CRISPR/Cas9, speed up plant breeding and the creation of genetic variation. Importantly for agriculture, they also broaden the plant species that can have agricultural traits relevant for future food security enhanced. Horticultural plants rather than grain crops, not often subject to biotechnology developments such as genetic modification, are more likely to be the subject of innovation. Some techniques may be attractive to conventional or organic producers. An example of this

is reverse breeding, where original parental lines used to produce hybrid lines are recreated. Development and uptake of these techniques requires clear regulatory pathways. However, those pathways are contested in most jurisdictions, with the regulation of the resulting crops becoming an increasingly sensitive subject-matter. Development of modern breeding techniques has triggered reviews of the Australian regulatory frameworks most relevant to food and agricultural produce, including Food Standards Australia New Zealand and Gene Technology Regulator. Final reports on those reviews are due in 2018. These may result in major shifts in Australia's regulatory approach to agricultural biotechnology, including operation on an output basis, focusing on resulting products, rather than an input basis, focusing on the process used to create products. Other jurisdictions are also moving to consider their responses to these modern agricultural biotechnology techniques. This paper will provide an update on regulatory responses and identify challenges for Australian regulators, the scientific community, and agricultural production and trade in light of them.

Conceptions of "Technology Supply" and their impact in the development of Territorial Innovation Systems *OSCAR A. FORERO, Corpoica-Colombia; SOAS-UK; Corina Buendia, CORPOICA; Eliana Martinez, CORPOICA*

Developing innovation territorial systems (ITS) in developing countries with rich cultural and biological diversity seems a reasonable path to development, and a simple process. What can be better for improving economic and social orders that achieving sustainable use of biodiversity by incorporating know-how that considers both techno-scientific and millennial practices with aim to make (or increase) the sustainability of livelihoods of farmers and small agriculturalist that still are most of population in developing countries. However, as any development expert or new practitioner would corroborate the process is not simple but highly complex. There are series factors that have prevented and continue to impede the development of ITS. In this paper (and presentation) we want to examine the case study of Corpoica in Colombia, which confronted the challenge of creating a methodology to develop ITS across the national territory now that a peace agreement has been signed with Colombian Revolutionary Armed Forces, a guerrilla group that operated for fifty years. We will discuss how differential conceptions of what constitutes technology supply, both from academia and policy makers promote or prevent the constitution of ITS. The developed methodology takes the framework of resilience to both provoke discussion on the role of technology in development, and to mobilise publics with different and often contradictory ideas to construct a unified plan for the use of biological and cultural diversity.

Session Organizer:
Susannah Chapman, Law School, The University of Queensland
Discussant:
Andrew Ventimiglia, The University Of Queensland

028. Experiments in Infrastructure II
Papers for Open Panels/Experiments in Infrastructure
Open Panel
11:00 to 12:30 pm
ICC: C2.1

This session is about learning from infrastructure innovations, including, but not limited to, water, energy, and transport. The session papers will explore learning from 'smart' or innovative infrastructure experiments (variously termed trials, pilots, and demonstration projects), arising from environmental problems or other factors. Fitting with the conference theme of Transnational STS, we will be discussing issues regarding the role of power in infrastructure experiments, and considering new ways of collaborating across contested borders and boundaries to enable more just transitions. The session will address pertinent questions related to learning and infrastructure innovations: Who is learning what from infrastructure experiments, and with what outcomes? Where are these experiments emerging (geographical location, type of organization)? What is the effect of learning and knowledge exchange (in development of new standards, policies, etc) arising from experiments? Who leads infrastructure experiments, and who benefits? This session contributes to a growing area of interdisciplinary scholarship regarding the mobility of policy and knowledge about infrastructural experiments, and its relation to governance.
Participants:

The Challenge of Translating Innovation into Transport Decision-Making *Simon Louis Opit, Massey University*

Transport planning is a critical part of urban governance and involves the safe and efficient movement of people and objects across a network of urban spaces. Yet, transport planning can often prove to be unresponsive to innovation and to the mobility of new ideas. The governmental context, specifics of technocratic arrangements and statutory regulatory processes can stifle the uptake of new concepts, cause projects to stagnate, diminish in scale or fail to be realised entirely. The exact causes of these less than ideal outcomes are multifaceted and difficult to determine as they involve a complex sociotechnical assemblage of various actors, institutions, resources and logics. This paper reports on research that utilises an in-depth case study and key informant interviews to assess the difficulties encountered during an innovative transport planning project in Auckland, New Zealand. Analysing the architecture of decision-making, the research illustrates how existing sociotechnical solutions within the transport planning assemblage can support 'institutional obduracy' through the everyday work practices of transport engineers. A network of 'tools of trade', regulatory provisions, organisational values and processes and professional norms are found to shape the decisions they make. The paper also examines the interface between central-local government roles and responsibilities in determining the approval or rejection of non-standard street treatments/devices.

Urban experimentation with nature-based innovations and infrastructures *Kes McCormick, IIIEE; Filka Sekulova, Universitat Autonoma de Barcelona; Rob Raven, Monash Sustainable Development Institute; Harriet Bulkeley, Durhan University*

Nature-Based Solutions (NBS) - the innovative 'use' of natural infrastructure for tackling societal challenges such as climate change, human health and inclusive societies - are increasingly recognized in policy and academic circles as potentially relevant in urban sustainability transitions. While the social, environmental, and economic benefits of NBS and their contribution to an urban transition to sustainability are well known, more research needs to be conducted on the governance mechanisms, learning

processes and innovation tools that can allow for their strategic, widespread, and equitable rolling out through urban areas and across national boundaries. Here we present our case study research on the social, technical and political dynamics of NBS in European cities and our methodology for understanding how innovation trajectories, structural conditions, governance modes, business models, civic engagement, and inclusion processes play a role in the diffusion and wider uptake of NBS. Through a comparative qualitative approach and a transdisciplinary design, we are learning about the experience of cities and the conditions that structure, enable, or constrain the systemic integration of NBS through municipal policies and planning instruments. Some of our key research questions are: What are the logics, expectations and visions through (and with) which NBS are being promoted? What are the institutional arrangements and forms of civil engagement that facilitate the emergence and implementation of NBS? What type of challenges do they face throughout time, (e.g. critical junctures or decisions), and how these influence the trajectory of NBS and what are the enabling and obstructing factors? Situating NBS in the emergence of new discourses on urban transition to sustainability in what sense can we think of NBS as technical, social, policy, cultural, or financial innovations? Finally, we also explore how NBS relate and depend upon other fields such as mobility, sustainable buildings, energy. Some preliminary findings on the questions listed above will be presented, as emerging from our research in Barcelona, Gyor, Leipzig, Malmo, Newcastle and Utrecht based on a sample of 18 NBS (including green corridors, urban parks, protected areas, community growing spaces, green roofs, restoration of river beds and water permeable surfaces). In addition to qualitative case study research, the analysis will also build upon descriptive and explanatory analysis of a new database with 1000 NBS experiments across Europe. The database was constructed between June-August 2017 and holds data on 997 NBS initiatives in Europe. The data captured in the database includes information such as place and scale, dates, goals and challenges addressed, ecological domains, services provided, governance arrangements, enabling drivers, costs and funding, types of innovation and impacts. Regarding the types of innovation, the database contains information whether the NBS initiatives are characterised as technological innovations (product, process or infrastructural), social innovations (policy, economic, governance or cultural) or system innovations. Moreover, the database contains an assessment of the degree of novelty (expressed in terms of whether an innovation is derived from previous initiatives with or without substantial adaptation, or whether the innovation is entirely new) as well as an assessment of 'upscaling', i.e. whether or not the innovation is transferred to other initiatives with or without substantial adaptation.

Who Bears the Risks of Data-related Urban Infrastructural Experimentation? *Sangeetha Chandrashekeran, School of Geography, University of Melbourne; Svenja Keele, University of Melbourne; Anne Kallies, RMIT*

Why is it that state-enabled metering infrastructure markets are proceeding largely unaffected by the significant regulatory risks and uncertainty in the emergent field of data security, access and circulation?

This paper argues that we are now in a new era of data-related urban experimentation where market-led investment in material infrastructure is decoupled from the regulatory risks surrounding the data. Drawing on the case study of the Australian Energy Market Commission market-led roll out of so-called "smart meters" the authors argue that the fundamental claimed benefits such as lower energy bills for consumers, demand side innovation and investment, are unlikely to materialise because of a lack of consumer access to data and services, and unresolved risks surrounding consumer privacy and protections, data ownership, and third party data access. The market-led roll out has commenced despite knowledge of these risks established in other jurisdictions, including the recent Victorian mandated roll out, the Federal investigation of data availability and use, as well as data privacy debates in Europe and the US. The authors map the relationships between key market and state actors to show how the regulatory risks surrounding data access and security are unevenly distributed to consumers and emerging capital interests, and the substantial benefits from hardware ownership and and guaranteed access to consumption data flow to incumbent energy retailers and large finance capital. The paper brings geographical political economy into conversation with STS. Urban data-related experimentation can only be sustained because of the political economy of market-led metering roll outs.

STS and Industrial Design Collaborations on Infrastructure Conceptualization, Design, and Maintenance *Juan Montalvan, Pontifical Catholic University of Peru*

In recent years the field of Industrial Design has moved beyond its traditional groundings on product design towards service and systems design. In this process it has expanded its human-centered theoretical and methodological resources through successful interactions with disciplines on the humanities and social sciences. Particularly, Industrial Design systems and services design exchanges with STS theoretical frameworks on infrastructure through transdisciplinary projects involving companies, communities, local governance, and academia, on topics ranging from climate change to food production; have allowed to address the aspect of invisibility in infrastructure from new perspectives nurturing both fields. From the Industrial Design perspective, crossing boundaries with STS has signified a more holistic approach to the understanding of infrastructure and how to engage its design via novel and improved system design methodologies. At the same time, STS works on infrastructure have found in Industrial Design a practical-oriented receptor open for discussion on the multiple dimensions of infrastructure, its conceptualization, design, and impact over people. This recent collaboration could foster infrastructure's holistic significance, both visible and hidden, from its conceptual definition, to its implementation and maintenance.

Session Organizers:
Heather Lovell, University of Tasmania, Australia
Andrew Harwood, University of Tasmania
Chair:
Andrew Harwood, University of Tasmania

029. Infrastructure, Worlding and Knowledge
Single Paper Submission
Open Panel

11:00 to 12:30 pm
ICC: C2.2
Participants:

Trans-scale & Transnational Study Of Gas Lighting : From Autonomous Units To Network Infrastructures, From The City To The Domestic Space, Governance, Resistance, France, Spain *BENJAMIN BOTHEREAU, EHESS CAK Centre Alexandre Koyré*

The gaslight was introduced in Paris in the 1830s. Yet, an oil streetlantern was an autonomous unit, a self-sufficient light disposal, independent from the other sources of light of the same street, while a gas light became an extension of a more complex "machine", a component of a large "system", a "network" infrastructure that included the gas works and the pipe-systems network. What did this technical change – and the change of scale implied- mean in terms of possible cultural narratives and practices? We will study the evolution of forms of streetlamps destructions in Paris and Barcelona, resulting in the "liberation" of gas and generating an outburst of flame and light, and therefore twisting the function of the rationalized and regulated gas flow. The second focus will be on the penetration of gas pipes in households and the narratives of integration or "invasion" associated. This paper will address these questions by a socio-historical approach. The methodology is undoubtedly inspired by the ANT study of large technical systems (HUGUES, 1983) and a SCOT approach, by studying the meanings of the technological artefact « lantern » shared by different social groups and the processes of its judgment, familiarization and social integration, echoing works of Silverstone and Hirsch on domestication (1992). The long-term issue is to benefit from this approach to contribute to our understanding of the expectations of the different public lighting actors (citizens, associations, companies, local and global authorities), the balance of power's dynamics regarding the regulation and production of lighting technology as well as the values and imaginaries attached to the material objects.

Coal mining industry in the process of Chinese industrialization (1840 - 1949) *Bocong Li, University of Chinese Academy of Sciences; Peiqiong Wang, University of Chinese Academy of Sciences*

It is widely accepted that the Opium War that broke out in 1840 was the turning point of China from the ancient times into the modern times. Coal mine industry played an important role in the Industrial Revolution in the UK and so did in China's industrialization, and then in China's social transformation. Twenty years after the Opium War, Westernization Movement or Self-Strengthening Movement rose in China, which marks the beginning of China's industrialization. In the process of China's industrialization, some modern coal mines were established. There are two main differences between modern coal mines and ancient coal mines. Firstly, in terms of coal mine technology, modern coal mines used steam engines to hoist, drain water and ventilate. Secondly, in terms of economic and management systems, modern coal mines established modern economic and management institutions, which are different from ancient institutions. The development of China's coal mine industry from 1840 to 1949 can be divided into three stages. The first stage is the beginning period (1840-1911). In 1875, the first China's modern coal mine was established in Keelung in order to supply coal for steamships and modern industries. At the same time or later, several other coal mines were built, among which the most successful one was the Kaiping coal mine. According to the data of coal mine exploration by Morris, a famous politician Li Hongzhang and a famous entrepreneur Tang Tingshu decided to establish the Kaiping coal mine. The output of Kaiping coal mines reached 25 thousand tons per day in 1897. In 1899, as a young mining engineer, Herbert Clark Hoover came to China, who later became the thirty-first president of the United States. Hoover made money up to four million dollars in the Kaiping coal mine in an unjustified way. The second stage is the developing period (1912-1937) and the third stage is period of the rapid increase in output (1937 - 1949). Modern coal mines need a lot of investment. In terms of investors, there were four types of coal mining companies, state-owned companies, foreign-capital companies, private Chinese companies, and Sino-foreign joint ventures. The history of China's coal mines from 1840 to 1949 shows us that many factors, including geological, technical, economic, political and cultural factors, Influenced the development of coal mines. On the other hand, the development of the coal mine industry also brought about the social transformation. It is worth our special attention that some coal mining cities, such as Fushun, Datong and Pingxiang, had sprung up and experienced a special fate in the process of China's modernization.

Climbing Conflicting Knowledge Infrastructures: Engineers without Taiwan, 1925-1950 *Kuo-Hui Chang, National Taiwan University; Gary Downey, Virginia Tech; Po-Jen Bono Shih, Virginia Tech*

This paper examines the normative commitments of two knowledge infrastructures by following people who tried to climb up through them - Taiwanese engineers. We describe movement through infrastructures as challenges to add "directionalities" - valenced pathways of travel that include knowledge, identities, and commitments. And sometimes they include dead ends. Taiwanese engineers thought they would be freed from the barriers of a Japanese knowledge hierarchy when the Empire of Japan handed Taiwan over to the Republic of China in 1945 - the Retrocession. Many would-be engineers had worked for decades to climb the Japanese infrastructures of industrial education and work that largely prevented Taiwanese boys and men from pursuing careers as anything more than low-level workers. Acceding to positions as managers or small business owners required strategic moves, considerable persistence, and good fortune. However, arriving Chinese engineers had themselves risen through contrasting infrastructures that challenged them to learn science, become scientists, and value scientific progress. Taiwanese engineers tried to adapt by quickly creating infrastructures that certified them as knowledgeable professionals. But the engineers were overwhelmed by the massive re-settlement of technical workers and the associated infrastructures of education and work that came with them. After fifty years of subordination within Japan, a new subordination within China made it impossible for engineers born on the island to embrace Taiwan as a normative outcome. At least for a while.

Narrowing the knowledge-action gap for infrastructure: The

role for science policy *Christine Kirchhoff, University of Connecticut; James Arnott, University of Michigan; John Katzenberger, Aspen Global Change Institute*

Decision-makers in public and private sectors are deciding how to invest in rebuilding and modernizing their crumbling infrastructure to support economic growth amidst changing social, technological, and environmental pressures. Informing these complex infrastructure investment decisions critically depends on making strategic shifts in science policy to support the development and brokering of usable knowledge including strengthening science-policy-practice connections. Numerous weaknesses at this interface stymie uptake of potentially useful knowledge and lead to a persistent "knowledge-action gap". Specific reasons for this gap are varied and include challenges to the supply of information, differences in culture, priorities, and communication between scientists and decision makers. We identify evidence-based strategies and tactics available to science policy-makers and program managers that could help foster more usable knowledge to guide 21st century infrastructure investments.

'The Alga-tron and the Aqua-Hamster: Engineering Models of Closed Sanitation Infrastructures to Live In Space.' *David Munns, John Jay College of Criminal Justice, CUNY*

ABSTRACT: In 2016, NASA announced the "poop challenge," just the most recent attempt to understand the problem of plumbing and sanitation infrastructure in space; a rich, long, and varied history that seemingly tried everything from alga-trons to aqua-hamsters. In both the Russian and American space programs, the overarching aim was to create closed-loop, ecological habitats for space stations, trips to Mars, and even generational journeys to other stars. In this talk, I shall show how it was engineers often contracted from aerospace, not ecologists, that discovered major insights into the working of whole living environments through closing the food-waste loops of humans and alage. Notably, in those early space habitat experiments one major discovery was that self-sustaining ecosystem must incorporate humans themselves as a functional component alongside an array of other living things. A generation later back on Earth humanity realized it had entered the Anthropocene, a period where human lives and societies are increasingly fundamentally altering the very climate and geology of Earth. It was the engineers and life scientists of the space programs who made the otherwise invisible infrastructure of sanitation not only visible but a necessary part of the space age and now teh Anthropocene.

Session Organizer:

BENJAMIN BOTHEREAU, EHESS CAK Centre Alexandre Koyré

Chair:

BENJAMIN BOTHEREAU, EHESS CAK Centre Alexandre Koyré

030. Unsettling STS 1

Papers for Open Panels/Unsettling STS: Scaling up critical indigenous analytics
Open Panel
11:00 to 12:30 pm
ICC: C2.3

How do contemporary forms of indigenous life, scholarship, and activism unsettle the political stakes and scholarly methods of STS? Recognizing that the 4S meeting of 2018 will be held on the historical and stolen lands of Australian indigenous peoples, this series of panels will explore the possibilities, the productive irritants, and inescapable problematics of thinking through the social study of science, medicine and technology in settler colonial societies. Settler colonialisms and technopolitics share long and complicated histories, histories which have only recently begun to receive critical attention within STS and related disciplines. Technoscience has pervaded indigenous engagements with the state, corporations, academics, and experts, generating paradoxical tests of legitimacy and new sites of wealth extraction, underscoring the entanglements between the nation, citizenship, knowledge claims, and land. Attending to specific sites of engagement and resistance demands new ways of doing (and undoing) STS scholarship. We seek papers that complicate the articulation and circulation of sociotechnical imaginaries; illuminate the ways archival and biomedical technologies shape claims to identity and belonging; and defy prevailing models whereby individual experts enroll allies and cultivate power. We are particularly interested in papers that speak to the legacy of colonial epistemologies in the history and philosophy of science and medicine, new innovative projects that work to decolonize medicine, science and technology (and science and technology studies itself), and speculative visions of an indigenous science studies. We also welcome submissions that subvert the conventional conference paper format, whether through video, audio, or literary productions or live performances.
Participants:

Agencies of Weather in Promulgating and Defying Colonialism *Sarah Wright, The University of Newcastle*

In this paper, I will consider weather, and the ways diverse knowledges of and about weather have been active in both promulgating and resisting ongoing colonialism in Australia. On the one hand, devices and representations of weather-as-technoscience have been deployed to shape and shore up the colonial endeavour even as the 'vagaries' of weather confound and resist control. Working against the colonial endeavour, diverse Aboriginal and Torres Strait Islander relationships with and as Country speak to very different ways of understanding weather that demand consideration of the embodied and affective ways sun, mist, seasons and other complex weatherings co-constitute people, place and time/s. Agencies of weather are fundamental in shaping who and what belongs to/with/as nations, both Aboriginal nations-as-Country and the settler-colonial nation of Australia, even as they help to constitute what these nations are, what they mean and how they conflict/co-exist. In this paper, I will consider a range of archival material and engage with Indigenous weather-songs that form part of my ongoing collaborative work with Indigenous knowledge authorities in Arnhem Land. I conclude this paper by positioning myself in relation to weather, thinking through what my relationships with and as weather mean as a non-Indigenous human geographer living and working on stolen land, committed to the complex, even intractable task of supporting decolonisation.

Beyond Settler Genomes: Temporality, Genomic Indigeneity, and (De)Colonization *Jennifer Hamilton, Hampshire College*

This paper explores recent attempts to "reconstruct indigenous genomes" from the DNA of so-called admixed (or "mixed race") peoples. I challenge the linear, teleological historical narratives that shape the project and demonstrate that the scientists rely deeply on what Mark

Rifkin calls "settler time" to make current conceptions of genomic indigeneity make sense. In particular, I argue that claims about extinct populations and the desirability of genomic salvage as well as assumptions about the stability of genetic populations and categories of admixture must be located in longer histories of racialization, colonization, and dispossession. The reconstruction of indigenous genomes invokes not only particular pasts but also specific futures. Thus, we must not read genomic technologies that purport to track the "history of humanity" simply as evocations of the past but also as statements of futurity, as part of a larger project imbricated not only in (re)telling histories but also in imagining futures. The temporal point, in Western time, of 1492 becomes a point of reckoning for not only a particular past but also a possible imagining of a particular future. To excavate these narratives is a way both to critique the assumptions embedded in this scientific retelling but also to think about ways to imagine different futures, futures not embedded in extant imaginaries of race, sex, and sexuality, and indeed the limited imaginaries of what science is and what it can do.

Burning the Capital *Jessica Weir, Western Sydney University*

The use of prescribed burning on public lands to reduce wildfire risk is a contested issue in southeast Australia, a debate that is transforming as these lands are progressively transferred back to, or shared with, Aboriginal land managers. Perspectives vary on the results and methods of the different sciences, especially fire science and ecology, as well as the role of Aboriginal people in fire management. Inflecting these debates are contradictory, inconsistent and shared understandings of 'science', 'Indigenous knowledge', and how they are navigated in relation to each other. This includes recourses to and critiques of the hyper-separation of 'tradition' and 'modern'. This paper explores how these conversations are transforming what we know, and how we might know it, when it comes to the management of public lands for wildfire risk, and the implications for practice and academia more broadly. I do so by presenting on my intercultural case study fieldwork of the Aboriginal practice of 'cultural burning' in Canberra. The case study is a collaboration with the Murumbung Yurung Murra rangers and the ACT Parks and Conservation Service, and is part of a larger project funded by the Bushfire and Natural Hazards Cooperative Research Centre. The paper is set within the broader agenda of developing an ethics of decolonisation towards both peoples and natures in settler-colonial societies, including through decolonising research.

Guaral and Leishmaniasis: Violent Encounters between Indigenous Medicine and Biomedicine in Conflict-Ridden Colombia *Lina Beatriz Pinto Garcia, York University*

This paper brings two histories together: the development of leishmaniasis first-line therapy–Glucantime–in France during WWII and the origins of American cutaneous leishmaniasis as a pre-Hispanic illness. It analyzes how these two histories meet in contemporary times in forested and rural areas of Colombia, a country that has gone through more than 50 years of armed conflict where leishmaniasis is often identified as "the war disease" or "the guerrilla disease". This work is based on ethnographic fieldwork conducted at a biomedical research institute's clinical facility and through the experiences of Awá indigenous people dealing with guaral–the word they use to refer to this disease. I explore the clash between biomedical and indigenous conceptualizations of disease, health and medicines that holds additional complexities given the entanglement between leishmaniasis and the Colombian war. Warfare marked the development of the pharmaceutical most commonly used to treat leishmaniasis, and it still marks how Glucantime circulates and is used today in Colombia. At the same time, scientists have played a significant role discrediting traditional medicine assuming its uselessness and failing to recognize that, if it weren't for indigenous treatments, leishmaniasis-caused suffering would be more extensive in rural Colombia. Although Colombia recognizes itself as a multicultural and pluriethnic state, I argue that the case of guaral/leishmaniasis shows that colonialism pervades biomedical research, that scientific knowledge remains the exclusive and exclusionary voice in health policy, and that intercultural approaches to health have not been entirely successful and are yet to be acknowledged as peacebuilding opportunities.

Hindcasting the Settler State *Jessica Cattelino, University of California, Los Angeles (UCLA)*

Ecological restoration aims to approximate a return to a prior state. As the restoration of the Florida Everglades – among the world's costliest and most ambitious ecosystem restoration projects – demonstrates of the United States, the methods and mindsets that guide restoration have much to tell us about settler colonialism. Ecosystem modeling, invasive species management, and archaeology show how science and policy build the association of whiteness with history into ecosystem restoration and management, while ethnography of the cultural politics of water among the diverse residents of rural South Florida –including farmers and farmworkers, bass anglers, state water managers, and Seminole water managers and users – traces how such science and policy come to matter in everyday practice and possibility.

Session Organizers:
denielle a elliott, York University
Tom Ozden-Schilling, Johns Hopkins University
Chair:
Thomas De Pree, Rensselaer Polytechnic Institute
Discussant:
David Turnbull, Deakin University

031. STS Africa: Biomedicine
Closed Panels
Traditional (Closed) Panel
11:00 to 12:30 pm
ICC: C2.4
This Panel seeks to explore the question "What are the boundaries of Science and Technology in Africa and how should we recognize and address both the uniqueness of African knowledge production and innovation on the one hand, and the potential that STS work in Africa has to offer to the field as a whole on the other?" We hope to answer these questions by working across the three domains of information technology, medicine, and the environment as they relate to Africa. We seek submissions of abstracts in the following three areas: Information Technology – In contemporary Africa, the music of modernity is the ring of the mobile phone. An Information Technology revolution has swept the continent especially with the adoption of the mobile phone, and in later years, the mobile internet. Multiple African STS scholars have

examined the mobile phone as a particular information technology that is co-constituted with Africa (de Bruijn, Nyamnjoh, and Brinkman 2009; Zegeye and Muponde 2012, Odumosu 2017). For example, de Bruji, Nyamnjoh, and Brinkman examine emergent innovations and new practices around mobile telephony such as healing practices (van Beek 2009), engineering design (Odumosu 2017) and mobile money platforms (Donovan 2012). Biomedicine – Similarly, much STS of Biomedicine in Africa has been in dialogue with Critical Global Health. Clinical trials have been a particularly important site for consideration of power and knowledge (Crane 2013, Kelly and Geissler 2012). In both the study of pharmaceuticals and the study of toxicology, Africa has also been part of the broader interrogation in STS of the tension in science between its claims to universality and its practice in particular places, because lab-based biosciences are figured as the most placeless and prestigious, and African scientists have challenged their exclusion (Okeke 2011, Pollock 2014, Tousignant 2013). There has been important work challenging the figuration of Africa as lack (Mkhwanazi 2016). Environment / Critical Studies of Infrastructure – The Environment is also central to how Africa is invoked. Africa is often used as a symbol of wildness on the one hand and underdevelopment on the other, and there is considerable scholarship of the intersections nature and development there (Walley 2004) that has much to offer STS more broadly. There has already been productive cross-talk between the spheres of Biomedicine and Environment. This is partly because of the way that, for colonial science, understanding the natural world in Africa was intertwined with other imperial projects including extracting natural resources of potential benefit to health (Tilley 2011). In the disparate spheres of bioprospecting and natural therapies on the one hand (Osseo-Asare 2014, Droney 2016, Foster 2017) and mosquito control on the other (Kelly and Biesel 2011), nature and medicine necessarily come together.

Participants:

Traditional Birth Attendants and the State: the mediating effect of Evidence Informed Policy Making (EIPM) on maternal health policy in Uganda *Emmanueil Benon Turinawe, Makerere University, College of Humanities and Social Sciences*

The arrival and rise to dominance of allopathic care in the colonies entailed the denigration of indigenous healing systems, branding them as ineffective and anachronistic. Conversely, many rural and remote areas remained outside the structures and reach of formal healthcare systems. During the postcolonial era, collaborative partnerships with indigenous healers were sought in order to reach remote rural peoples. By the 1950s, the World Health Organization (WHO) together with national governments had set up collaborations with a group of healers, who became universally categorised as 'traditional birth attendants (TBAs)' assisting in the delivery of maternity care. By the 1990s – coinciding with the rise of the evidence-based medicine and policymaking (EIPM for short), there was growing concern that the integration of TBAs was not achieving the desired outcomes in reducing maternal mortality rates. This led to the promotion of a new category, 'skilled birth attendants (SBA)' – defined to exclude TBAs. With this shift, TBA services were discouraged, banned and even criminalised. Yet despite the issuance of threats of arrest, our ethnography in Luwero, Uganda, observed the syncretic, and yet secretive utilisation of both TBAs and formal care amongst the community. TBAs were always an artificial category created to service biomedical interventions;

designated practitioners did not identify with it, nor did they legitimate their practices through it. Consequently, TBAs remain a statistical anomaly that is difficult to organise, account for and govern - they do not map onto the processes of EIPM. However, their persistent use by communities brings to light the uneven and ambiguous relationship between global health science and policymaking and the health care needs and practices of targeted communities.

"Do not use herbs!": Plants and Pills in Maternal Health Care in Ghana *Abena Osseo-Asare*

By the end of the 20th century, women living in African countries had a 1 in 15 lifetime risk of dying during pregnancy. Many resided in rural areas where state of the art maternity wards in hospitals were not available, or in urban settings where hospitals were overpriced and overextended. So, many women turned to neighbors, family, and healers to help them through pregnancy and labor. This talk considers efforts in the West African country of Ghana to improve maternal care through a network of trained "Traditional Birth Attendants," or TBAs. Interviews with policy makers and healers reflecting on their involvement in TBA programs from the 1970s as well as archival documents, training manuals, and observations from field research in the Akuapem Mountains, show how Ghanaians hoped to implement a program widely touted through the World Health Organization as critical to stopping maternal mortality. In particular, the talk will analyze the use of both pharmaceuticals like Syntocinon (synthetic oxycotin) and plants like Nfofo leaves (Aspilia africana) in peri-natal care. Overtime, Ghanaian policymakers encouraged TBAs and healers to avoid using herbs to stop hemorrhaging and other complications. By the early 2000s, government went so far as to ban TBAs, and urged all women to deliver with a skilled attendant such as a nurse midwife or obstetrician.

Representing African Women: A Case for Maternal Survival Narratives *Adeola Oni-Orisan, UC San Francisco/UC Berkeley*

The high risk of maternal death in Africa has cast a shadow over experiences and representations of pregnancy and childbirth. In the 1980s, amidst new awareness of disparities in maternal mortality rates between high and low-income countries, tragic anecdotes of women dying during childbirth emerged as a tool to garner political and economic support for global health interventions aimed at women. While successfully raising public concern and billions of dollars in aid, given that these stories are some of the few stories of African women so widely circulated, it is important to ask what else does the genre of maternal death narrative do. What possibilities are foreclosed? How might discursive practices around childbirth structure the care offered to African women? And what power relations are revealed in this form of knowledge production and promotion? In this paper, I first examine how maternal death narratives function and structure potential solutions to the problem of maternal mortality. As these narratives tend to overlook the plethora of ways that women have survived, I use my fieldwork with pregnant and birthing women in southwest Nigeria to explore the ways that women piece together different sources of care in an effort to ensure successful deliveries amidst considerable uncertainty. I

argue that we have at least as much to gain from maternal survival narratives as we do from the often-told maternal death narratives. In focusing on the pathways to death, women's bodies are foregrounded as sites of knowledge production over their experiences.

Technology and the teaching hospital: objects, concepts and curricula in Ghanaian medical education, c. 1923-2018 *John Nott, Maastricht University*

Established in 1996 in order to address the dearth of medical education in Ghana's northern savannah, the University of Development Studies (UDS) hosts an innovative medical school curriculum developed in conjunction with Maastricht University. Such international collaborations must, however, be considered in view of the history of European involvement in African medical education. By offering a broadly defined and historically informed ethnography of teaching technologies at UDS this research will provide insight into the assumptions of universality which underpin the internationalized medical education – itself an under-investigated medical technology – as well as its specific translation into an African context. Drawing on historical and ethnographic study at UDS, this paper explores how pedagogical technologies – both material and conceptual – have travelled to northern Ghana. Rarely produced with a mind to students in the Global South, material technologies found in African medical schools are imbued with assumptions relating to the presentation of disease, to cultural preconceptions of health, to environment and to infrastructure. However, STS scholars have shown that a technology's inscription does not equate to its use (e.g. Akrich 1992; de Laet & Mol 2000). The process of technological translation is further complicated by abstract technologies of ethnicity and language which collude to skew medical knowledge toward national and international standards. We use the tension between inscription and translation to trace the "ir/relevance" (M'Charek 2005) of (neo)colonialism in medical education, while also thinking conceptually about the technologies of medical education which might contribute to a more considered postcolonial STS.

Understanding Biomedicine from the Homestead: Knowledge-Being in Multiple Worlds *Abigail H Neely, Dartmouth College*

Understanding Biomedicine from the Homestead: Knowledge-Being in Multiple Worlds What happens if we center our analysis of biomedicine in the homestead instead of the clinic? What lessons will we learn about the possibilities and limitations of science? I start with Sandra Harding's provocation that to understand science, we must adopt a "standpoint" other than that of Western science. In doing so, I center my analysis of the production of (scientific) knowledge(s) in the household – with the people and their landscapes – of rural Pholela, South Africa in order to rethink the development of a world-famous brand of social medicine. In this story, social medicine is multiple, taking form not just from health care workers, but also from the bodies, lives, healing practices and landscapes of Pholela's residents. To understand the multiple frameworks of health and healing enacted in Pholela's homesteads, I employ the concept of multiplicity, drawing on diverse scholarship from feminist STS (Barad 2007; Harding 2009; Mol's 2002), health and healing in Africa (Feierman 1985,

Feierman and Janzen 1992), and the work of multispecies ethnographers (de Castro 1998; Kohn 2013; Ogden 2011) to emphasize the coming together of knowledge and being – the multiple ontologies and worlds of Pholela's residents. Through this work, I hope to bring the idea of multiplicity – the incorporation of knowledge-being worlds beyond science – into scholarship about STS in Africa. Starting in the homestead and understanding these new worlds builds on recent STS scholarship about Africa (Langwick, 2011; Mavunga 2012; 2017) and promises to teach us much about science, knowledge, and being in Africa and beyond.

Session Organizers:
Toluwalogo Odumosu, University of Virginia
Anne Pollock, Georgia Tech
Discussant:
Anne Pollock, Georgia Tech

032. Environmental Visualizations: Connecting Images, Knowledge, and Politics II
Papers for Open Panels/Environmental Visualizations: Connecting Images, Knowledge, and Politics
Open Panel
11:00 to 12:30 pm
ICC: C2.5

We welcome papers that explore the creation, design, use, and societal politics of visualizations in the environmental context. Visualizations are images or representations that communicate information in accessible formats to specific audiences. In 1990, Woolgar and Lynch published Representation in Scientific Practice, which examined the use of diagrams, drawings, and graphs to depict scientific data. This work has been updated (e.g. Pauwels 2005; Coopmans, Vertesi, Lynch, and Woolgar 2014) to include medical imaging, economics graphing, and other applications. However, relatively little work has concentrated on visualizations of environmental and social issues, their production and character, and their role in civil society discourses, government policy-making, and industry practices. Over the past 30 years, visualizations have become influential artifacts in reshaping both public knowledge and citizen agency. Increasingly, visualizations are designed to be interactive and to convey narratives. This panel will look critically at the nature and politics of visualizations as ways to know and learn about environmental matters. A key area of interest is to compare visualizations and interpretive conventions across diverse cultural and national settings, especially in the Asian region. Examples of potential topics include the rise in participatory mapping of air pollution in urban areas, the graphical representations of biomonitoring data, the use of GIS to track environmental hazards, and the real-time coverage of wildfires. Visualizations also play a central role in climate change science and politics—such as mapping droughts, sea level rise risks, and changing disease ranges. Visualizations can connect land use, health, ecosystems, and industry in novel ways.

Participants:
Translating the unknown: meaning-making potentials of climate change visualisations *Eugenia Lee, University of Sydney*

This paper critically examines the ways in which visualisations are being designed and used by journalists in the communication of climate change issues. Methods of information visualisation have fast become a meaningful way to represent specialist knowledge to general audiences, lowering barriers to data while increasing visuality. Yet there is little empirical

consideration of its qualitative potentials that gesture towards the idea of visualisations as sites of meaning. Through heuristic evaluation and semiotics, this paper analyses key examples from a corpus of 547 climate change visualisations taken from generalist news publications in the US, UK and Australia. While limited in logical reasoning, these climate change visualisations show the potential for interactive design to situate climate change issues in the immediate realities of readers. By eliciting readers' tactile engagement, visualisations are able to make tangible the invisible impacts of climate change, creating meanings of relevance, while translating scientific discourse into the life world of readers.

Visualization and Science Communication: A Historical Study of Typhoon News Reporting and Visualization in Taiwan (1958-2015) *Shulin Chiang, Chinese Culture University*

This paper aims to explore the visualization of scientific news in the case of typhoon news during the period of year 1958-2015 in Taiwan. The fields of meteorology, journalism, and visualization respectively have accumulated abundant literature. However, the existing literature seldom focused on the combination of these abovementioned three fields. This project intends to bridge the gap and to conduct a longitudinal analysis of the content of typhoon news since 1958, the year the Central Weather Bureau started to announce typhoon warnings. It investigated the application and development of the visualization of meteorology, as well as the representation and production of meteorological visualization. It hopes the findings could contribute to the development of scientific visualization in the future, advance science communication and encourage public engagement of science. Theoretically, this project critically reviews the literature on uncertainty of meteorology, the visualization theory, how visualization was applied in science communication of meteorological information and in meteorological news. Methodologically, a triangulation of data collection methods was utilized. Firstly, it collected typhoon news from the United Daily News during the past 57 years, and then purposively samples to collect significant events from TV and Internet news. A comparative analysis on news reporting and visualization of three different media was conducted. Secondly, consultation and interviews of meteorological experts and media staff was used to investigate the following issues: the process of visualization, the criteria of selection of meteorological information into mappings, and the relation between the concerns of designers and the presentations of graphics.

Visualizations of the Ozone Hole and Global Climate Change -- Towards Stabilization? *Stephen Zehr, Univ. Southern Indiana*

The visualization of the ozone hole quickly stabilized in the 1980s. These visualizations were colorful and sometimes (along with associated text) anthropomorphized the hole. They also represented a local phenomenon as global, were transportable across scientific and popular texts, and were helpful in policy contexts. Perhaps due in part to this success, many climate change scientists, environmentalists, and popular writers have tried to find the visual image(s) that would sway populations to become invested in global climate change. However, they have largely failed at generating a stable image for any length of time. Many of these images represented a "global" environmental problem as local (e.g., polar bears on ice edges, factories emitting smoke, a dry landscape, wildfires) and many have been easy to subvert by opposing parties. But that hasn't kept scientists, environmentalists, and others from continuing to try. Interestingly, some recent scientific and popular images have emerged that seem to mirror ozone hole visualizations. The paper draws upon a non-randomized, cross-national sample of scientific and popular press visualizations of climate change across different nations. I comment on the challenges of stabilizing visualizations of climate change, and whether pursuit of that project is worthwhile.

Visualizing and Creating Chemosocialities in Cancer Graphic Narratives *Juliet McMullin, University of California, Riverside*

Visualizing our relationship with chemicals and cancer is imbued with histories, politics, economies that both foster life and death. Murphy's (2008) "chemical regimes of life" and most recently Shapiro and Kirskey (2017) have argued that "chemosociality…shared and shifting chemical ecologies" that create a host of relationships require greater attention. Because chemosocialities are in part, predicated on the dual nature of many toxins as both cause and cure, these chemical relations might also be considered a boundary object. People come to know, expect, and hope for ways of living depending on their relation to the chemical and the extent to which they understand the depth of their relations. Knowledge of these chemosocialities are not only shared between scientific communities and activists, but also weigh heavily on people whose lives have been affected by toxins. Focusing specifically on toxins associated with cancer's chemicals, I examine another marginalized relation for the transmission of knowledge of chemical ecologies. The recent increase in memoir and autobiographical graphic narratives about cancer, offer insights into how and why knowledge sharing in the form of comics become meaningful for multiple publics, and provides a provocative method for visualizing complex chemosocialities. Drawing on visual narratives and interviews with comics artists, I examine how cancer graphic narratives create an innovative form of visualizing chemosocialities. Importantly, the physical graphic narrative moves beyond the individual author/artist and biosocial communities, circulating imagery and ways of knowing how we come to understand our relationship with cancer's chemicals.

Visual Representations of Human Biomonitoring and the Pollution in People *Rachel Washburn, Loyola Marymount University*

Human biomonitoring is a technique used to measure environmental chemicals and/or their breakdown products in human fluids and tissues. Biomonitoring data provide environmental and public health scientists with information about the types and concentrations of environmental chemicals present inside people's bodies. Over the past few decades, the use of biomonitoring has expanded dramatically to include government agencies and advocacy organizations. As part of a multisite ethnography, I collected visual materials produced by major users of biomonitoring to analyze how this technique and the chemical relations it helps scientists to illuminate are constructed. For advocacy groups, visual

imagery serves as a potent way to introduce audiences to biomonitoring and to the profound problems biomonitoring data reveal: We are all polluted and potentially imperiled by a wide array of toxic chemicals. This message is communicated through images such as smokestacks in the chest of of a living body or a middle-aged white woman with a warning label across her chest that she contains cancer-causing chemicals. While these images are meant to be provocative and jarring, they often reference familiar forms of representation such as X-ray images, cigarette warning labels, and the periodic table. In contrast, imagery featured in government pamphlets and reports is quieter and more mundane, and no clear problem is presented. I argue that these different forms of visual representation are part of a broader politics around biomonitoring and that meaning of biomonitoring data.

Session Organizer:
Alastair Iles, UC Berkeley
Discussant:
Alastair Iles, UC Berkeley

033. How Does Mobility Change Researchers, Research Groups And Scientific Communities?
Papers for Open Panels/How does mobility change researchers, research groups and scientific communities?
Open Panel
11:00 to 12:30 pm
ICC: C2.6

Spatial mobility – the movement of researchers between organisations and countries – has become a ubiquitous phenomenon and a major concern of science policy. It is assumed to foster learning and the recombination of ideas and thus to accelerate scientific progress. At the same time, it puts a strain on researchers, may lead to clashes of different research cultures, and forces research groups to cope with the loss of competencies when members leave. Many science systems create "forced mobility" by the succession of fixed-term positions. International mobility may turn into migration, which raises fears of a loss of expertise and of a national community's elite, a fear which is shared by developing and developed countries. Communication between scholars has been transformed by the digital age. While some heralded these advances as the ultimate destruction of geographic barriers to science, scientific mobility remains central to the education, communication, and advancement of the scientific workforce. Collaborations continue to be both initiated and sustained through in-person interaction and a large share of high performing scientists are internationally mobile. However, mobile scholars face mounting barriers as isolationist policies become a reality in resource-intensive countries. Furthermore, scientific mobility itself tends to be privileged and reinforces the Matthew Effect in science: mobility is most available to those who already have established professional networks, bountiful resources, and domestic freedoms. hared by developing and developed countries.

Participants:
Scientific Mobility and Research Careers *Richard Woolley, Ingenio (CSIC-UPV) Universitat Politècnica de València; Carolina Cañibano, Ingenio (CSIC-UPV) Universitat Politècnica de València*
Despite the fact that international experience has become an expected element of scientists' careers (Ackers 2008), mobility has not been systematically incorporated in thinking about research careers. Only a small part of the literature connects geographic mobility with research careers. Lawson and Shibayama (2015) found short-term research visits are associated with more rapid career advancement (promotion) among Japanese biologists, but post-doctoral studies abroad are not. Laudel and Bielick (forthcoming) found that early career researchers' mobility depends on the characteristics of scientific disciplines. More commonly, scientific mobility has been linked to aspects of research performance that may have career effects. Studies have addressed questions of whether international mobility boosts publication productivity, or increases the scientific impact of those publications (Asknes et al. 2013, Fernandez-Zubieta 2009, Franzoni et al. 2014, Halevi et al. 2016, Lu and Zhang 2015), with mixed results. This paper's contribution is to systematically link scientific mobility to models of scientific research careers. The paper first identifies and describes six functions of scientific mobility which can be found in the literature. It then reviews three prominent models of research careers (Bozeman et al. 2001, Bozeman & Gaughan 2007, Gläser 2001, Laudel and Gläser 2008, Stephan et al. 2014, Stephan and Levin 2001), clarifying how the variable of mobility effects research careers under each of these approaches. The paper argues that this has the benefit of constructing a framework for analysing the epistemic, institutional, and personal factors shaping mobility and their consequences for research careers under different interpretive scenarios.

How do career scripts shape the mobility of early career researchers? *Grit Laudel, TU Berlin*
In many countries, early career researchers frequently move between organisations. This seems to be due to two conditions which are remarkably uniform across many research systems and research fields, namely the short duration of postdoctoral positions and the strong political expectation of early career researcher mobility. Thus, much of the early career mobility we observe is "forced mobility" (Ackers 2008). And yet, researchers in some fields are more mobile than others, as our empirical data show. We draw on interview-based case studies and CV data of German researchers in three fields (experimental AMO physics, plant biology, early modern history). The field-specific mobility patterns can be explained by the observation that researchers not just make isolated decisions on organisational positions but enact career scripts (Barley 1989). Career scripts are collectively shared interpretive schemes that represent typical successful careers. We show that these career scripts are not only field-specific but also refer to the different social contexts a researcher simultaneously works in. Researchers enact a script of their cognitive career which describes the development of an individual research programme (IRP), a community career script of gaining sufficient reputation for being hired on the next position, and an organisational career script describing the sequence of positions best suited for developing an IRP. These scripts are strongly shaped by epistemic practices of the field, which make organisational mobility a necessary, facilitating or indifferent condition. This is why the standardisation of science policy's mobility expectations is likely to be detrimental to careers in some fields.

The Changing Face of Academia: Analysing the Interplay Between Career Structures and Geographical Mobility *Marie Sautier, University of Lausanne*

My research aims at understanding the growing (Powell, 2015) yet heterogeneous (Franzoni et al, 2012) phenomenon of academic mobility and internationalisation in relation to the changing structure and de-standardisation of careers in academia (Enders & Musselin, 2008). What impact do recent organizational changes - such as New Public Management - have on the mobility patterns of early-career researchers and, reciprocally, how does geographical mobility contribute to transforming career structures and individuals trajectories? How is mobility built into early career researchers' scripts across different institutional, disciplinary and international environments? I examine the complex phenomenon of mobility through the life course and the work market perspectives. I focus on the cases of two contrasted academic systems: France, where the academic system has been traditionally based on local and intra-national recruitment, and Switzerland, where the academic system is highly internationalised with 50% of the overall academic workforce coming from abroad, and where local researchers perceive a 'postdoc abroad' as an inescapable requirement. Based on a two-year ethnography of various institutional structures that contribute to foster and define academic norms, such as appointment committees and mentoring activities, I explore how institutional actors incorporate the themes of 'geographical mobility' and 'internationalisation' into the current discourses about 'academic excellence.' In addition, based on the narratives of forty researchers of various origins, disciplinary backgrounds, genders and family arrangements, I explore how geographical mobility unfolds into early-career scripts in both France and Switzerland.

Trans-National Mobility and Research Careers in the Human and Social Sciences: assessing individual self-discovery processes *Carolina Canibano, INGENIO (CSIC-UPV); Richard Woolley, Ingenio (CSIC-UPV) Universitat Politècnica de València; Carmen Corona, INGENIO (CSIC-UPV)*

This paper draws on the conceptualisation of a research career as an evolving path through a network of jobs and roles that takes place in a context of high uncertainty and over which the researcher progressively builds her identity, gaining knowledge regarding her own capacities (Cañibano and Potts 2016). As shown by Lam (2016), Spivak l'Hoste and Hubert (2012) and Coey (2017), sectoral and geographical mobilities shape how researchers perceive themselves and their role in scientific communities. We conduct an empirical analysis drawing upon research undertaken in the course of a European Project across 13 countries, throughout which a total of 320 interviews were conducted to address the factors shaping the careers of doctorate holders in the social sciences and humanities. We build on those interviews to analyse processes of individual self-discovery triggered by trans-national mobility across three different contexts of change. We group the contexts in which self-discovery through mobility may take place in three main categories, distinguishing between: i) changes in the epistemic context; ii) changes in the socio-cultural environment; and iii) changes in the professional-organisational context. We consider how trans-national mobility within these three contexts stimulates and shapes processes of self-discovery. For example, changing the epistemic context

can lead to the learning of new skills or the development of particular competences about which the researcher was not previously aware - but which may alter the selection of future research questions, for example. The specific contours of individual self-discovery that shape researchers' identities and careers are thus considered to be outcomes of the diverse mobilities that are increasingly integral to the scientific vocation.

Session Organizer:
Grit Laudel, TU Berlin
Chair:
Cassidy Sugimoto, Indiana University Bloomington

034. Reflexive Engagements in Climate Engineering
Papers for Open Panels/Reflexive engagements in climate engineering
Open Panel
11:00 to 12:30 pm
ICC: E3.10
Participants:

Better By Design? *Peter Healey, InSIS, Oxford University*
A forthcoming article, drawing on a UK scenarios workshop on climate engineering, suggests that an array of challenges, including the Paris agreement, 'recast the governance of climate engineering as less of a slippery slope and more of an uphill struggle' (Bellamy and Healey, 2018). It concludes, it might now be appropriate for policy goals to be developed less with the aim of constraining research on climate engineering, and more with the purpose of finding the grounds on which it may be responsible to incentivise it. GRIP (Greenhouse Gas Removal Instruments and Policies Project) a research project which started work in summer 2016, exemplifies this approach, applying it to a range of candidate technologies which aim to remove greenhouse gasses permanently from the atmosphere. GRIP characterises the policy instruments and incentives which might be used to propel these (mostly immature) technologies along the pathway from research, development and demonstration to the point where, as fully developed sociotechnical systems, they can be assessed as to whether they have any contribution to make to managing climate change, alongside conventional mitigation and adaptation. Preliminary results from the GRIP research - which includes interviews with a range of stakeholders and public engagement work - will be presented along with reflections on how this approach to research might affect the role of researchers and issues of power over research outcomes and uses.

Climate Geoengineering Governance *Steve Rayner, University Of Oxford*
The Climate Geoengineering Governance Project was a collaboration involving STS researchers from Oxford and Sussex Universities and University College London to explore governance challenges raised by the Royal Society's report, Geoengineering the Climate. The project focused mainly on the governance of research and development, covering economic, legal and social issues at national and international levels. Methods included documentary and discourse analysis, focus groups, and key-informant interviews. International activities included research workshops in Singapore, China and India. The project concluded that Geoengineering must be located firmly in context of mitigation & adaptation, but it is

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questionable whether such technologies can be scaled up in a timely fashion. Nevertheless, from an STS perspective, the ongoing debates about climate geoengineering are of particular interest because the values informing them are unusually explicit as there is, as yet, little science to hide behind. The study of geoengineering discourse provides opportunities to explore representations of nature, debates about what constitutes the good society, the role of technology in our lives, social justice, etc.?

Discourses of Development in Efforts to Mainstream Geoengineering into Global Climate Policy *Jeremy Baskin, The University of Melbourne*

The Paris climate agreement marks the beginning of a geoengineering turn in climate policy. This notably includes negative emission technologies such as Bioenergy with Carbon Capture and Storage (BECCS). The Paris agreement simultaneously both excludes and enables controversial solar geoengineering technologies, those using sulphate aerosols. I examine the implications of these two technologies for the global South and explore the ways in which particular discourses of development and intervention are mobilised when discussing their role in climate policy. I argue that the geoengineering turn is rooted in a view of how the world ought to be re-arranged, which emanates from the global North but is expected to be applied in the global South. The embrace of BECCS can be understood as a type of colonial thinking in the ways it imagines a significant reshaping of activities occurring in the global South. The likelihood that it will 'work', both socially and technically, is low. One consequence is to make solar geoengineering appear unavoidable. I show how the techno-hubristic thinking which pervades solar geoengineering is increasingly accompanied by developmentalist discourses arguing that its embrace is essential not only for climate change to be contained but also for justice and development.

Engaging the Teaching Place with the Anthropocene : A Case for STS Education Through 'Simul-Action' *Isabelle Juliette Giraudou, The University of Tokyo*

How can Environmental Law and Policy education engage with the proposed 'Age of Humankind'? This paper is largely a speculative attempt to answer the question. Focusing on interdisciplinary pedagogical frameworks in Japan, it considers a course in 'Science, Technology, Society (STS) and Environmental Governance' as a possible illustration. Given in English at the University of Tokyo, this course addresses the need to re-examine governance frameworks for dealing with environmental crises and risks of scientific-technological provenance. Focusing on earth sciences, biotechnology and climate geoengineering, it examines various cases of cross-fertilization between STS (that investigates the relations between science production and policy outcomes) and global environmental governance (where several international institutions and transnational platforms meant to be science-policy interfaces have been established). Through role-play simulations, students scrutinize the relevance of such 'boundary organizations' and contemplate their legitimacy regarding the development of negotiated rulemaking processes in environmental regulation. Put in the footsteps of different stakeholders, they envision more distinctly the implications of an understanding of 'environmental

problems' and 'risks' as social constructs. This paper discusses the practical and theoretical conditions under which integrated syllabi and 'simul-action' pedagogical frameworks may help to connect more strongly environmental governance studies with both Disaster STS (as an emergent subfield of inquiry) and the 'Anthropocene' scientific proposal, approached at the interface of environmental sciences and environmental humanities. In so doing, it seeks to shed further light on the significance of STS education for the progressive building in post-Fukushima Japan of a transdisciplinary 'Anthropocene curriculum'.

Scientific Advising in Boundary Organization: Epistemic Matter in the Mission Policy of the IPCC *Hiroyuki Kano*

Intergovernmental Panel on Climate Change (IPCC) is regarded as a prominent example of boundary organisation. This institute engages not only in the compilation and assessment of current state of knowledge on climate change, but also the design of policy instruments and the evaluation of its impact – those activities are known as boundary work at the science-policy interface. Boundary work is a practice attempting to prescribe proper ways of behaviour for participants from different spheres through demarcation, at the same time it practice aims to find productive coordination through a division of labour. Those prima facie opposite activities prompt the question about the epistemic difference between scientist and policy-maker. This presentation seeks to evaluate that to what extent the difficulties of boundary work can be overcome in accordance with the current IPCC's organisational declaration. IPCC states that its assessment reports are "policy-relevant and yet policy-neutral, never policy-prescriptive". However, making a strict interpretation, we face a number of potential discordance in this statement. This resultant misunderstanding might thwart IPCC's efforts. After identifying the connotation in key terms – relevance, neutrality, and prescription – in comparison with the similar kinds of concept, I offer suggest a possible and plausible way of interpreting the mission policy, as well as more general lessons for improving the scientific advice in policy-making.

The influential but diverse epistemic community of climate engineering research and policy *Nils Matzner, Departement for Science, Technology and Society Studies (STS), AAU Klagenfurt*

The intentional modification of the earth system in order to slow down global warming, i.e. climate engineering (CE), is researched, consolidated, and popularized by a community of experts. Knowledge production and dissemination of CE is largely driven by a community that has an underlying informal governance structure. This expert formation can be described as an epistemic community (EpiCom) due to its authoritative claim to policy-relevant knowledge (Haas 1992). Researchers, policy analysts, and some civil society actors assemble in an international and transdisciplinary community to investigate CE, a former taboo and now possible option against climate change. Taking conceptual shortcomings of the EpiCom concept into account – such as the underlying linear model of science-policy interaction – this paper pursues two goals. First, it will reconstruct how the intentional and unintentional influence of the EpiCom impacts societal and policy actors, while vice versa, the

EpiCom is very receptive to policy trends (e.g. the Paris Agreement). Second, it will highlight the inner boundary work between subgroups and reasons for their divide (e.g. positions on desirability of large-scale field experiments). The discourses and networks of the CE EpiCom help to understand its inner entanglements.

Session Organizers:

Peter Healey, InSIS, Oxford University

Anjali Viswamohanan, Council on Energy, Environment and Water

035. Reproductive Governance in East Asia
Closed Panels
Traditional (Closed) Panel
11:00 to 12:30 pm
ICC: E3.2

This panel is engaged with the reproductive governance in East Asia. Each of the five papers analyzes how diverse stakeholders, including the state, medical societies, activist groups, media, and lay users, negotiate the meaning and build public action of reproductive technologies. Following the analytical approach of technoscientific governance, we emphasize the making of new knowledge and new ways of doing technology along with the governance. The cases range from prenatal testing as bio-capital in China, assisted reproduction financing as pronatalist policy in South Korea, egg donation regulation in East Asia, first IVF within the sociotechnical imaginaries in Japan, Korea and Taiwan, to the population quality control for China's recent two-child policy. With the emphasis on the comparative studies, we aim to demonstrate the sharp contrast in reproductive governance within East Asia, and to better capture an East Asian bio-power.

Participants:

Winning the "Second Chance": Prenatal Genetic Testing, Personal Choices and National Future *Jianfeng Zhu, Fudan University, China*

Chinese government in 2016, loosened its notorious one-child policy and every couple is allowed to have two children. In the meantime, Chinese government determines to promote the so called "precision medicine" aiming to provide the individual health care plan for every person. I would argue such motion in return reinforced yousheng policy in the field of prenatal genetic tests. In addition, the booming biotech genetic testing companies offer more "choices" for the couples through the geneticist working in clinics. Under such circumstances, this paper aims to closely examine how the prenatal genetic tests are practiced for those whose first child has certain genetic abnormality. Using prenatal genetic test as a case, I intend to show how the state sees life can be (re)produced as bio-capital and envisions the national future can be well managed by the rationality of every population policies. In the laboratory, through routinized practices of genetic testing , life indeed is separated as the bare and the bio, seemingly manageable. However, I also intend to show that such rationality is embraced and challenged by the actors involving in the network consisting of clinicians, geneticists, salesperson, couples as well as the children and even fetus in the everyday practices of prenatal genetic testing.

Yousheng Policies and Technologies: Population Quality Control in Contemporary Urban China *Dong Dong, Hong Kong Baptist University*

The tension between the quantity and the quality of human reproduction has always been apparent in contemporary China. When the two-child policy was initiated in 2016, the state's control over the "quality" of its population seemed to be facing a dilemma: on the one hand, the two-child policy wishes to expand China's labor pool by encouraging more births; on the other hand, it may encourage more women over age 35 to have their second child, which in turn may cause an abrupt increase in the rate of birth defects. The National Health and Family Planning Commission (NHFPC) repeatedly emphasized the prevention of birth defects as a "focal point" for the sake of "comprehensive two-child policy reform". But, unlike a commodity, the "quality" of a baby can hardly be assured even through the strictest "quality inspection system". Then the questions are: how does the Chinese state deal with the dilemma between population quantity and quality? What political, economic, and social strategies does the state invent, adopt, and utilize to solve this dilemma? This study is based on our ethnographic studies on human reproduction in China since mid-2000 and a thorough archival study on policies and regulations related to yousheng in contemporary China. We also trace the historical change of prenatal genetic testing practices in China since the 1990s and reveal the significance that selective reproduction technologies can have in social, cultural and regulatory terms, and the role that they can play in shaping governance practice.

When Population Policy Meets ART *Jung-Ok Ha, National Museum of Korean Contemporary History*

South Korea features the lowest total fertility rate (1.17 in 2016 and 1.08 in 2005) in the world and advanced assisted reproductive technology (ART) as well, meaning that not only is there a general tendency to have fewer children but still a strong desire for them even through surrogacy and/or egg donations as well as in vitro fertilization (IVF). I'd like to talk about the negative effects of the policies coming out of concern about low fertility on the governance on ART. Korea began to support ART through coverage under the national health insurance scheme in October 2017, the first to do so in East Asia. Public financing of ART differs by country in terms of implementation and coverage. European countries expanded this financing in step with tightening ART regulations. A good example is the regulations on the number of embryos transferred (e.g. single embryo policy) with the aim of reducing multiple births like twins or triplets. In Korea, public financing for ART began as an aspect of the policy against low fertility in 2006. Recently, however, the occurrence of premature birth and babies with low birth weight has risen drastically along with an explosion in multiple births. Furthermore, with public financing, total cycles of IVF have risen and more recently, cases of surrogacy and egg donation have also increased. Korean governance of ART was initiated not out of consideration for the health of mothers or babies but by the fears of the consequences of low fertility. What is more concerning is that "more NHI benefits" are being proposed by the new "candle revolution" government and an increasing number of infertile couples are requesting "wider NHI coverage." I propose that it is about the time for governance on ART to separate from population policy.

Considering the Impact of Socio-Cultural Factors on the Regulation of ART regarding Egg Donation in East Asia *Azumi Tsuge, Meijigakuin University; Hyunsoo Hong,*

Department of Public Policy, Human Genome Center, The Institute of Medical Science, The University o; Minori KOKADO, Osaka University, Japan

The purpose of this presentation is to examine how socio-cultural factors influence IVF with egg donation, and how they reflect on the regulation of Assisted Reproductive Technology (ART). We examined these factors by conducting fieldwork, studying legislation, and collecting statistics about ART in South Korea, Taiwan, and Japan. Despite these three countries facing common social issues, such as low birth rates and governmental policies of pronatalism, the regulation and practice of ART varies. Japan has no laws regulating ART but the Japan Society of Obstetrics and Gynecology (JSOG) issues guidelines. According to these guidelines, since the late 1990's only a few clinics or hospitals have been permitted to arrange noncommercial egg donations, mainly from the recipient's sister. However, a recent study discovered that around 300 babies are born a year through egg donation procedures undertaken in foreign countries. South Korea enacted the Bioethics and Safety Act in 2005 that includes an article to protect donors and prohibit commercial egg donation. Taiwan enacted the Artificial Reproduction Act in 2007, which allows foreigners to receive eggs from anonymous donors in exchange for a small token of their gratitude. According to the Taiwanese government, more than 400 Japanese couples underwent IVF with egg donation in a small number of fertility clinics from April 2014 to May 2016. This study conducts a comparative analysis of the logic informing ART regulation using the statistical information collected, in context of the social and cultural backgrounds of the three countries involved.

First Test-Tube Babies as Technopolitical Tuners *Chia-Ling Wu, National Taiwan University*

This paper argues the importance of researching a nation's "first test-tube baby" as the fruitful site to unravel the dynamics of reproductive politics. I argue that the voices center upon the first IVF case not only reflect the nature of sociotechnical system, but also work to shape the reproductive governance. I conceptualize the event as "technopolitical tuner", which receives multiple decoding of the innovation, and then sets the major tune for further processing. It should be an important research agenda to open the black box of the technopolitical tuner to understand the diverse configuration of IVF in each country. I use the cases in Japan, Taiwan and South Korea to illustrate the point. In Japan, the first test-tube baby was born in a non-leading medical college of Tohoku University in 1983. While the medical societies were negotiating the ethical guideline and some prestigious medical centers were waiting for the rule, Dr. Suzuk took the lead to announce the success of first test-tube babies. This intensified the controversy, and led to the strong self-regulation of Japan Society of Obstetrics and Gynecology (JSOG) by making registry, reporting, and ethical statement. By contrast, the first test-tube baby in Taiwan, born in 1985, was celebrated as the national achievement, and thus transformed IVF from a potentially controversy technoscience into a glorious innovation fitting for Taiwan's national sociotechnical imaginaries. This paves the way for doctors-led governmental regulation. The first test-tube baby was born in South Korea, half year later. Due to the fear against the population control policy, Dr. Kim of Seoul National University Hospital kept it as low

profile by claiming it for personal scientific curiosity. Neither the government nor the medical society took action in regulating IVF. The attuning power of the first-test-tube-baby event impels the contour of reproductive governance.

Session Organizer:
Chia-Ling Wu, National Taiwan University

036. Collating Publics In Collections Of Human Biological Material And Data 1
Papers for Open Panels/Collating publics in collections of human biological material and data
Open Panel
11:00 to 12:30 pm
ICC: E3.3
The panel seeks to explore how particular 'publics' – of citizens, stakeholders, populations, or otherwise – are put together through collections of human biological materials and data. Contributions study how publics are co-produced in technoscientific, social and political orders that shape the formation of repositories containing human biological materials and data (as applied in e.g. the medical, forensic, migration policy context). Papers address, but are not limited to, the following questions: how database systems and their classifications configure ontological entities with particular normative ascriptions of publics; how practices of taking samples, producing, storing and exchanging materials and data, and governing databases enact, affect or mobilize notions of citizenship; how political issues produced by and reflected in such databases are negotiated and thereby (re)make affected publics and forms of (biological) citizenship; how the materiality of database infrastructures and networks that make databases work enable or constrain imaginaries of collectives; how such databases give rise to ecologies of participation that mobilize engagement. In this panel contributions present empirically rich and conceptually informed reflections on the relations between the collection of human biological materials and data, and the formation of diverse publics and forms of citizenship, across different cultural locations, contexts of application and forms of storage. With the contributions to this panel, we thereby explore the empirical, theoretical and political significance of how human collectives are imagined in practices of collecting. In this first session papers are assembled which reflect about how data collection entails different imaginations of publics in various contexts.

Participants:

Imagined Publics In Medical Research Collections: Tracing Circulations And The Making Of Public Value(s) *Erik Aarden, University of Vienna*

Public engagement has grown into a prominent concern for medical research, motivated by the assumption that this will make individuals more likely to participate in research projects. Especially in the context of large scale collection, storage and study of materials and data in so-called 'biobanks', engagement appears to have achieved the status of an ethical principle on par with traditional issues such as ownership, confidentiality and consent. Nevertheless, a substantial body of work in STS has shown the limitations of public engagement and its projections of (a) public(s) affected by technoscientific activities. In this paper, I seek to extend this line of thinking by exploring how particular configurations of relevant publics are imagined in the collection, storage and research practices of medical biobanks (conceived broadly) in the United States, Singapore, and India. On the basis of interviews and analysis of study documents, I

propose a preliminary typology of different forms of 'publics' imagined for these collections. These include a public of participants to be recruited and maintained as research objects; a public of scientific peers who should be attracted as collaborators; and a broader global public that stands to benefit from insights generated in these studies. I argue that through these diverse imaginings of the public, collections are positioned as sites for the production of knowledge that has both local and universal validity. This paper thereby provides insight into how contemporary medical science is made to travel and, moreover, how such travels intersect with imaginations of science's public value(s).

Infrastructuring data-publics: Implications of design and governance of transnational biometric database systems *Nina Amelung, University of Minho*

In recent years we witness the growth of transnational biometric database systems which derive from attempts of surveilling suspect populations in order to anticipate and investigate criminal and terroristic threats. This paper deals with the implications of database systems – in particular their design and governance, but also their organic unfolding within environments – on understanding and regulating data-publics. How do we know about and understand data-publics constituted through transnational biometric surveillance technologies and what are limits of knowing? How do the IT governance systems and the organizational work design of database systems (infra)structure how data-subjects are entitled to and have access to exercise rights? This paper focuses on two examples of transnational biometric database systems set up for criminal identification and migration control purposes in the European Union: the decentralized forensic DNA data exchange system regulated under the Prüm decisions and the centralized fingerprint database system EURODAC. The empirical basis are policy documents and secondary literature representing the EU internal IT and security discourse reflecting the composition of transnational biometric database systems. Engaging with the literature on epistemic and bureaucratic authority structures of "e-infrastructures" the paper investigates their impact on constituting data-publics and enabling or disabling data-subjects. It explores 1) how DNA or fingerprint technologies provide different authority of knowing about data-publics; 2) how centralized and decentralized architectures of database systems shape different classifications of data-publics; and 3) how governance and designs of database infrastructure produce different vulnerabilities to potential function creep with impact on framing data-publics and data-subjects' rights.

Evidentiary Status of DNA Testing for Family Relatedness in Danish Family Migration Politics *Linda Lund Pedersen, London School Of Economics & Political Science*

In this paper I will interrogate the role of DNA testing in applications for family reunification in Denmark. DNA testing has become an integrated feature of the technologisation of border-control in everyday life of crossing borders, which includes documentation for family reunion and therefore even more sophisticated ways of producing and circulating biometric data. Biometric extend the border beyond (inter-)national borders as it comes to regulate the forms and constellation of daily life through governing who is to be considered as

legitimate family member through ideas of genetic relatedness (child = parent). This research is based on a 15 months ethnographic study of Danish family reunification practices, where I have been following the production of evidence for family reunification. The materials for this study include information from Immigration Service and State administration, conversations with board members of Marriage without Borders, interviews with forensics medical staff, and family reunification application forms with Children. In this presentation I will engage with the questions that emerged through my ethnographic pursue of family reunification: Who is called to the laboratory for DNA profiling and matching, and under what condition? Overall I am following the connections and interplay between forensic laboratories, scientific methods, and migration politics to investigate production of scientific evidence and its formative role in family making in migration control.

Sorting Apart: Sampling Practices and Shaping Publics in DNA Studies of "Roma" *Veronika Lipphardt, University College Freiburg, Albert-Ludwigs-Universität Freiburg; Mihai Surdu, Albert-Ludwigs-Universität Freiburg, University College Freiburg*

The paper examines the sampling procedures in genetic studies of "Roma" (peoples historically called as "Gypsies" by European majorities) published since 2000. All of these studies reinforce – or simply take for granted – the genetic coherence of this population group from the perspective of medical-, population- or forensic-genetics. However, as with other population genetic investigations, the sampling processes appear as crucial in constructing that population's "groupness," their history and identity. In the paper, we discuss how geneticists compare "Roma" to "indigenous," "Europeans" or the "white population," using sampling guided by pragmatic considerations, especially alliances among geneticists, state actors and public figures that facilitate recruitment and overcome resistances of research subjects. We argue that claimed genetic isolation of "Roma" is an artifact resulting from the very design of these studies. The genetic coherence of the "Roma"– along with their seemingly stark genetic differences from the groups selected for comparison – is an outcome of sampling strategies (based, for instance, on exclusions of individuals of "mixed-" race and -ancestry in the field and in the lab), extrapolations from small, localized samples to large populations, circulation of assumption-charged and biased data sets, and the interpretation of findings in the light of genetic isolation and "foreign" Indian origin. We conclude by suggesting that, for geneticists, the "Roma" provide an optimal tool for shaping publics, as they seemingly mirror a group that enables identity building by contradistinction with notions of biological citizenship and race.

Session Organizer:
Nina Amelung, University of Minho
Chair:
Torsten Heinemann, RWTH Aachen University

037. Political Transformations of Developmental Origins of Health and Disease (DOHaD) and Epigenetics in the Global South 2

Papers for Open Panels/Political transformations of Developmental Origins of Health and Disease (DOHaD) and epigenetics in the Global South

Open Panel
11:00 to 12:30 pm
ICC: E3.4

DOHaD and epigenetics have growing relevance to the health programs around the world and are a key platform in global health initiatives such as the World Health Organisation and United Nations. Issues of nutrition, living and working conditions, environmental exposures, poverty and inequality are key to conceptual understandings of health across the lifecourse and in postgenomic programs such as environmental epigenetics and microbiomics. This panel invites papers that interrogate the ways in which DOHaD and epigenetics intersect with local knowledge and local biologies in the Global South, and the broader politics of governance and biopower that such programs may entail. We envisage themes such as: how DOHaD and epigenetics are translated into cultural practices of reproduction, eating, care and kinship; the uptake of notions of biological plasticity; and how the politics of race, colonialism and violence are imbricated and negotiated in encounters between life science, history and daily lives, particularly in the Global South. These themes are not exhaustive and we welcome other contributions in this field.

Participants:

PLASTICITY, BIOPOWER AND EMPIRE: An Archaeology
Maurizio Meloni

Histories of plasticity of the body and direct environmental effects on the human genome or microbiome become more visible by the day. It is particularly in the Global South or among vulnerable populations in the North, that scientists find compelling cases to detect this emerging porosity of the body to its local surroundings. Environmental effects are mostly seen in negative terms: pollutants, malnutrition, violence and trauma. I suggest here an archaeology of plasticity as a tool of biopolitical government in ancient and early-modern times before the rise of the modern biomedical body. I claim that particularly with humoralism in its global ramifications, the biopolitical problem of how to live with a permeable body –plasticity as a form of life - is pervasive and unequally distributed across gender and ethnic groups. The differential plasticity of various populations was used since the beginning of Western medicine as a form of biopolitical distinction between ruling and ruled groups, Greeks and Asians, temperate countries and the tropics, inaugurating a tradition that will last until nineteenth-century colonialism: plasticity at the service of military conquest. I argue then that we need to excavate this deep history of plasticity as always gendered and racialized to see why today it is particularly on the bodies of women and oppressed groups that this notion has become visible in biomedical writings. This paper is a contribution to a reconceptualization of the history of racism and biopower as entangled with notions of plasticity and environmental effects rather than fixity and innateness.

The political load of the mismatch model *Flavio D'Abramo, Max Planck Institute for the History of Science*

In this paper I analyse the allocation of responsibilities performed through epigenetics and DOHaD in contexts where material resources are limited such as in the societies of the Global South. First, I show the peculiarities of the mismatch model which is at the very core of most of the DOHaD hypotheses and where e phenotype which develops in a specific, usually poor, perinatal context is expected to develop a malfunctioning when the late, adult context doesn't match the early one – i.e. the perinatal context. Through some case studies I highlight the ideological load of transporting the mismatch model, which has been developed within wealthy, western, neoliberal societies, in societies of the Global South, or situated micro-context which are expected to "develop" within similar, economic trends. Then I ask if what doesn't match is the organism (and its early environment) with its material, adult context, or if instead is the societal, usually-poor context which gave shape to the phenotype (which is expected to be susceptible to various diseases) which doesn't match with an expected or real economic growth.

Time, trauma, and the brain: some implications of environmental epigenetics research on suicide risk *Stephanie Lloyd, Université Laval*

Global statistics report that 25% of adults recount experiences of childhood physical abuse, and further, that 20% of women and 8% of men recount histories of childhood sexual abuse. While these experiences have long been associated with a variety of long-term mental and physical health problems, new narratives of the effects of child abuse are emerging in environmental epigenetics research. These narratives will be the focus of my presentation. Specifically, I will discuss ongoing epigenetics research that advances two claims. The first claim is that child abuse induces highly specific epigenetic changes in a person's brain that are associated with a specific set of psychopathological traits whose most extreme end point is suicide. Second, in contrast to gene-environment interaction models, for example, in which a person had to have a predisposing genetic risk factor to respond negatively to a certain environment, in environmental epigenetics models, anyone who experiences child abuse is at risk of suicide by virtue of an acquired epigenetic profile. Given the "wrong" environment, anyone is at risk. These models have consequences for (1) the presumed nature of trauma, time, and psychopathology – with time seen as biologically embedded and bioactive and past experiences of stress able to re-enact that same stress in the present – and (2) the scope of "at risk populations", with profound implications for core assumptions about human nature and subjectivity.

Transgenerational Epigenetics and Ancient Practice: Fetal Education in East Asia *Chikako Takeshita, University of California, Riverside*

This paper explores the relationship between the science of transgenerational epigenetics and the traditional practice of fetal education known as taikyo, taijiao, or taegyo, which was introduced to Japan from China during the 8th century. There is an uncanny synnergy between what transgenerational epigenetics and developmental origins of health and disease (DOHaD) studies have unveiled and the foundational idea behind taikyo, which holds that gestational parent's mental state and behavior affect fetal development, the ease of childbirth, and the offspring's life-long character. Self-help guides that teach expecting parents how to facilitate the intellectual development and character enhancement of their future offspring by listening to classical music and eating a special diet can be found in almost every Japanese bookstore. Although taikyo has been accepted and passed down over generations as a kind of wisdom that does not

require verification by Western scientific data, there are also books by Japanese authors that attempt to explain its merit through developmental psychology and neuroscience. To what extent, then, has taikyo been recast through epigenetics and DOHaD? To answer this question, I will examine newspapers and magazine articles published since the year 2000 and popular books on the taikyo and relevant subjects. Findings will shed light on how the pregnant body, fetal environment, and pregnancy as a liminal state for an offspring are scientifically and culturally co-constructed in the context of contemporary Japan.

Local knowledge of DOHaD in New Zealand *Tatjana Buklijas, Liggins Institute, University of Auckland; Helen Johanna Ker, University of Auckland*

New Zealand has played a significant role in the history of DOHaD, a field built around the notion that influences received during early life shape the long-term health, in particular the risk (chronic) disease of the individual and, through behaviour and epigenetic modifications, its descendants. Namely, New Zealand researchers were among the founders of the field in the early 1990s; a thriving research institution (Liggins Institute) built around the idea of DOHaD was founded in 2001 in Auckland; and New Zealand scientists played a key role in the establishment of DOHaD in Singapore and China. The same period has seen an increased interest in the knowledge of the New Zealand indigenous people, Māori, and the ways in which this knowledge can be brought to bear upon institutions and practices: for example within law and public health. Yet while DOHaD has often been invoked as a field crucial to improving the lives of Māori, seen to suffer disproportionately from the poor early life conditions as well as historical trauma, there have been no attempts to bring Māori concepts into the field. This paper looks at the history of DOHaD in New Zealand, explanations for its success and its intersections with the Māori and Māori knowledge. It interrogates how indigenous (Māori) knowledge may come together with the DOHaD paradigm; whether it is practically possible in a way that does not perpetuate colonization, and how (local) DOHaD might change should such an exchange take place.

Session Organizers:
Megan Warin, University of Adelaide
Michelle Pentecost, Kings College London
Fiona Ross, University of Cape Town
Maurizio Meloni

Chairs:
Fiona Ross, University of Cape Town
Maurizio Meloni

038. Digitised Medicine and Healthcare Practices
Papers for Open Panels/Critical Digital Health Studies
Open Panel
11:00 to 12:30 pm
ICC: E3.5
Participants:

Critical Discourses and Deliberations for 3D Printing in Medicine *luke heemsbergen, Deakin University; Robert David Ewan Fordyce, The University of Melbourne*

This paper considers the challenge of enabling deliberative frameworks of governance in the distributed design, manufacture, and care required for 3D printing in medical practice. Crucially, it understands 3D printing as a socio-communicative set of practices tied to specific manufacturing technologies. Understanding the governance requirements that pervade this science-society-technology constellation is especially acute in the medical field; 3D prints trans-mediate human pathology and care through both the digital and physical in ways that offer novel treatments and over-bearing discourses of both peril and promise. The paper focuses empirically on two sites for discourse analysis: The first seeks 'public knowledge' about medical interventions involving 3D printing sourced through a Factiva search (Jan 2016-Jun 2017 of relevant terms, N:822) in Australia. The second targets the Therapeutic Goods Association's 2017 consultation and discussion papers on 3D printing, as well as their resultant expert submissions. While interpretation of data is ongoing, we offer a framework concerned with how Australia imagines and is forming its relations to current and emerging clinical practices that utilise nonbiological 3D printed objects. We hope to map public sentiments to the regulatory deliberation to consider how these debates a) are informed b) promise innovation in equality, efficiency, and effectiveness, and c) can afford rough consensus in relation to what are deeply personal politics. This is especially pertinent to science and technology studies as the political economies of medical practice transition from Evidence Based Medicine paradigms to those of Precision Medicine and DIY democratisation.

Group Therapy: Mental Distress in a Digital Age — An Arts Based Case Study in Critical Digital Health *Vanessa Claire Bartlett, UNSW Art & Design*

This paper proposes that creative research from art and design can play a role in supporting the developing discourse of critical digital health studies. It uses a case study exhibition of digital artworks and objects that I curated called Group Therapy: Mental Distress in a Digital Age to make this argument on two counts. Firstly, it asserts that aesthetic experience is increasingly recognised as a site for producing transformative knowledge that can leverage real world impact and support wellbeing. Secondly, it suggests that experimental psychosocial approaches to curatorial practice deployed in the making of this exhibition, afford unique aesthetically driven evidence-based insights into how the relationship between technology and psychological distress is experienced by exhibition audiences. This process reveals not just the psychological impact of the artworks but also speaks to the wider role of technology in the cultural imaginary. I assert that knowledge generated engages with Deborah Lupton's calls for more experiential, emotionally cognizant perspectives on interactions with health technologies. Group Therapy: Mental Distress in a Digital Age was initially co-curated with FACT (Foundation for Art and Creative Technology), UK and shown again at UNSW Galleries, Sydney for The Big Anxiety: festival of art + science + people. It explored connections between mental health and the technologies and political conditions that structure our lives. This paper frames the exhibition using data generated by a psychosocial research method called the visual matrix (see also panel 099) which was used as part of an iterative curatorial process to drive deep audience engagement.

Socio-technological imaginaries, assistive robotics and

transformation of care *Niels Christian Nickelsen, Aarhus University, Department of Education*

In the media and at political/managerial levels there is currently focus on the opportunities for Denmark to re-perform itself through digitization and welfare technology. Feeding assistive robotics (FAR) is one prioritized form of welfare technology, relevant to citizens with low or no function in their arms. Yet, despite various highly profiled national dissemination strategies, it proves difficult to recruit suitable citizens. This paper discusses technology developers' and governmental agencies' socio-technological imaginaries concerning assistive robotics. We argue that imaginaries intertwine with various stakeholders' organizing of their worlds with FAR and discuss the tinkering, experimentation and attuned attentiveness that is inevitably part of implementing assistive robotics in care work. The ANT idea of "follow the actor" inspired the study that took place as a multi-sited case study at different locations in Denmark and Sweden. As such, based on desk research, observation of meals and interviews the study examines socio-technological imaginaries and their implications for users and care providers. Human - FAR interaction demands thorough engagement, tinkering and understanding of the particular situation of the user. This study contributes to STS and socio-technical imaginaries by providing an empirical example of analysis from the middle of things in a manner where political imaginaries, the technology developers' assumptions concerning usability, and users and care providers hassles are in focus.

Talking Over the Robot: A Strained Human-Robot Collaboration in a Dementia-Prevention Class *Chihyung Jeon, KAIST*

This paper analyzes the use of Silbot—a "dementia-prevention robot"—in a regional health center in South Korea. Based on an on-site observation of the Silbot classes, this study shows that the efficacy of the robot class relies heavily on the "strained collaboration" between the human instructor and the robot. "Strained collaboration" refers to the ways in which the instructor works with the robot, attempting to compensate for the robot's functional limitation and social awkwardness. This tension stems from Silbot's ambiguous identity—teacher or teaching instrument. In bringing Silbot into the classroom setting, each instructor employs characteristic verbal tones, bodily movements, and other pedagogical tactics. The instructor even talks over the robot, downplaying its interactional capacity. The robot is rendered present or absent, useful or intrusive, depending on the instructor's need and the students' attitude. This paper concludes that this three-party interaction should be an important element in designing and evaluating the dementia-prevention programs with robots. Any success of such robot programs requires a deeper understanding of the spatial and human context of robot use. Acknowledging and analyzing the strained collaboration in the robot class can lead to specific recommendations for engineers, designers, instructors, and policy makers in educational and elderly care robotics.

Session Organizer:
  Deborah Lupton, University of Canberra
Chair:
  Deborah Lupton, University of Canberra

039. How Do They Understand the Science? Communicating Science, Risks, and Disasters 2
Papers for Open Panels/How do they understand the science? Communicating science, risks, and disasters
Open Panel
11:00 to 12:30 pm
ICC: E3.6

Recent disasters have put science into the spotlight and have allowed non-scientists to see how science operates in their daily lives. Climate change, earthquakes, violent storms, wildfires, and epidemics have been a few of the disasters that cross borders and dominate our headlines. Scientists have their own understanding of these disasters, and work on a bedrock of science that is comfortable with uncertainty (be it in reporting a margin of error, or in talking about approximations rather than absolutes) and tend to expresses risk in terms of numbers and statistics. In turn, science communication, as well as disaster communication, often operates on the principle that people do not know the facts well enough and need to be informed about them (the so-called "deficit model"). Recent research, however, shows that such a model takes little account of the culture and perceptions of risk of the audience. Research likewise shows that the process of communicating scientific knowledge to reduce risk in disaster-prone areas, or of getting a disease or a health hazard, is usually carried out with little understanding of how the community would understand and act on such knowledge. We invite researchers who work in science and risk communication, especially those who examine the audiences who received information about risk and disaster to contribute to our panel. We look for papers that would shed light on the unique epistemologies of our audiences, and how these understandings can change how they view the world, and the role of science in it.
Participants:

Sources of information in times of scientific uncertainty: an exploratory analysis on the Zika virus in Brazil *Andre Sica de Campos, Unicamp; Janaina Costa, Unicamp; Rhiannon Kroeger, Louisiana State University; Wesley Shrum, Louisiana State University*

During the Zika virus epidemics in Brazil in 2015 newborn babies were diagnosed with microcephaly. Frequently, measurements of cranial circumference diverged from the scientific standards and its relationship with Zika was unclear. This prompted general interest, with the Government and the World Health Organization declaring a national emergency. Due to the limitations in respect to knowledge about Zika virus, the public, medicine doctors and scientists had to cope with this situation with limited knowledge. This paper discusses the sources of information for health professionals and the public in general in relation to scientific uncertainty. We present evidence on the sources of information used by health professionals and members of the public about the Zika virus. The contribution of this paper lies on the nature of the data, studies about the Zika outbreak focus on data extracted directly from media sources. This study covers a random sample of health professionals and the population in general - including those directly exposed to the outbreak. One hundred interviews covered the frequency, sources of information and perceptions about the Zika virus. As expected, members of the public reported access to narrower sources of information. However, the types of media sources used by health professionals converged with those used by the public in general. We argue that scientific knowledge could have been harnessed in more effective ways, by helping in the

communication of the actual known risks, degree of State support to public science and healthcare and state of the outbreak.

Watershed Citizen Science: Toward Democratic Governance? *Sharon Moran, SUNY - Environmental Science and Foresty*

The intimate relationship(s) between bodies, watersheds, and the state is being challenged by innovative citizen science projects. Routine water quality monitoring, once provided by authoritative agencies, has sometimes been eclipsed by the immediate, finer-scale data produced by volunteers and posted on easily-accessible websites. In this case study of a lake monitoring citizen science project in New York, the social epistemology of watershed citizen science can be interrogated, and its shifting meanings and significance will be unpacked. Using preliminary results from interviews with project participants and community residents, this paper strives to make sense of how people respond to new information that underscores the proximity between their toilets and their taps. Because the testing including pharmaceutical metabolites, caffeine, and sucralose, people's awareness of incomplete wastewater treatment is heightened, along with the risks associated with drinking water that has become tainted by it. Conceptual shifts emerge from this citizen science initiative in connection with notions of metabolism, the bodies, pristine places, and domestic infrastructure. While some observers have celebrated citizen science as way to cultivate environmental citizenship, and further democratize governance, others have questioned its capacity to be truly transformative. These monitoring participants are engaged in co-production of data, and the process itself renders the information qualitatively distinct and different than other environmental data. The impacts of both existing projects as well as potential future opportunities will be considered, and the paper argues for the necessity of scale as an analytical category in theorizing environmental citizenship.

The Signal and the Territory *Adam Bobbette, University of Cambridge*

This paper shows how the modern geographical notion of territory has emerged through the choreography and co-ordination of earth signalling processes. I argue that contrary to the modernist scientific conception of the "linear-model" in which scientists unproblematically monitor nature and communicate their findings to a self-evident "public," the modern sciences of nature prediction have transformed the earth into a signal emitting medium. Through the elaboration of infrastructures and instruments, the science of earth monitoring, instead of extracting the facts of nature, have constituted complex and non-linear assemblies. It is in the process of this constitution that I argue the politics of signalling emerges. I illustrate this argument through an account of the emergence of volcano forecasting on the active volcano Mount Merapi in Java over the course the late 19th through to the 20th century and I show that the transformation of the earth into a signal created openings for complex deformations and transformations of political assemblies that make controversial and contested claims about the meaning of the interior of the earth. To do so, I compare the practices of signal processing by modernist scientists in a state observatory and shamans on the upper flanks of the volcano.

Session Organizers:
Maria Inez Angela Zamora Ponce de Leon, Ateneo de Manila University
Anto Mohsin, Northwestern University in Qatar
Chair:
Maria Inez Angela Zamora Ponce de Leon, Ateneo de Manila University

040. Neurosocieties: Interdisciplinary Explorations of the Brain, Culture and Ethics 2
Papers for Open Panels/Neurosocieties: Interdisciplinary Explorations of the Brain, Culture and Ethics
Open Panel
11:00 to 12:30 pm
ICC: E3.8

In the last two decades the neurosciences have become a highly prestigious and influential force in contemporary societies. The significant symbolic and financial resources invested within neuroscience research (e.g. the EU's Human Brain Project, and the US' BRAIN Initiative) as well as its translation into practice and policy raise a number of pressing issues for social scientists, bioethicists and STS theorists in particular. Thus, the Neurosocieties interdisciplinary open panel will address themes such as: the influence of brain-based explanations of personhood, health and behaviour in contemporary communities; how these explanations align and conflict with other ways of making sense of personhood; new social forms emerging in response to the rising prestige of neurosciences; and the responsible management of the expectations of patients, families and carers regarding promising neuro-interventions. Additionally, recent developments within the neurosciences – particularly the emerging interest in culture and social context – have created new opportunities for productive engagement between neuroscience, social science and ethics. Accordingly, the interdisciplinary panel will call for papers from STS, anthropology, philosophy, bioethics and related disciplines that explore new options for conceptualising: the relationship between brain, body and environment; the relationship between thinking, feeling, mood and cognition; understandings of agency and moral responsibility; and interdisciplinary perspectives more generally, on the brain, personhood and culture. The panel will prepare the ground for an interdisciplinary special issue on Neurosocieties.

Participants:

Neurasthenia Reincarnated: Examining the Rise of Autonomic Nerve Dysregulation in Contemporary Taiwan *Jia-shin Chen, Institute of Science, Technology and Society, National Yang-Ming University*

Autonomic nerve dysregulation (zilü shenjing shitiao; hereafter AND) has recently been gaining popularity in clinical encounters in Taiwan. However, its meaning remains vague. Unlike a formal medical diagnosis, it refers to a wide array of physical and mental symptoms whose pathologies are allegedly associated with the autonomic nervous system (ANS). As the ANS controls vital functions of human beings, such as heartbeat, respiration, digestion, and sex, AND signifies morbidity of vitality. Most medical practitioners concur that AND symptoms are functional but not necessarily psychological. In this sense, AND is similar to neurasthenia, which was once prevalent but is now obsolete. However, how are they related? To answer this question, this study draws on in-depth interviews with clinical practitioners on both notions of neurasthenia and AND. It also traces the ebbing of neurasthenia and the

rise of AND in contemporary Taiwan by reviewing relevant literature and archives. Preliminary findings suggest that AND should not be treated as a mere continuation or euphemism of neurasthenia. Rather, it is more appropriate to conceptualize AND as neurasthenia reincarnated through the conjoining of several factors, such as concretizing technological innovation (specifically heart rate variability measurements), transnational knowledge travel, medico-cultural syncretism, and public stigma of mental illness. That is to say, AND may have acquired some features of neurasthenia, but it is now a new, though amorphous and heterogeneous, entity. This case offers great insight into the ways in which science, technology, and society interact and reincarnate a medical concept.

Schizophrenia, Neuropharmaceutical Cultures and Patient Potentialities *Julia Brown, Ms*

The severe manifestations and outcomes for those being treated for serious mental illnesses in Western societies is of pressing concern, as gaps in life expectancy widen despite greater access to healthcare. My anthropological enquiry into pharmaceutically-treated schizophrenia is positioned at the intersection between social and biomedical sciences and technologies. I explore the lived meanings of benefit-to-risk ratios when it comes to cognitive efficacy and drug side effects of the 'gold standard' antipsychotic drug clozapine. Clozapine is regularly monitored via blood work and cardio-metabolic checks, as patients commonly face multiple 'physical' health conditions alongside 'incomplete recovery' from schizophrenia. Drawing on 18 months of fieldwork at two 'clozapine clinics' in Australia and the UK, I argue that there is a dissonance between patient and clinical conceptions. Patients in my study worked actively and creatively with their circumstances and the biomedical imaginaries available to them to temporally experience agentic freedoms and personhood, and 'health' beyond their clinical symptoms. Building on the phenomenological underpinnings of schizophrenia, I suggest why these potentials for self-reclamations and experiential forms of well-being deserve careful attention from clinicians and researchers otherwise focusing primarily on neurobiological treatment possibilities. Moreover, my research would not have been possible without careful collaboration with a neuropsychiatrist who had not previously been exposed to ethnographic approaches. My project thus evidences the productivity of interdisciplinary endeavours, adding stimulus to pursuits of STS when it comes to exploring the brain and the role of culture.

Shifting boundaries: from sensory integration dysfunction to digital medicine *Wen-Ching Sung, University of Toronto*

In this paper, I examine the evolvement of "sensory integration dysfunction" (SID) since the 1960s. The genealogy of SID illustrates how neuroscience reshapes the disciplinary boundary and introduces a new treatment paradigm embodied in the so-called "digital medicine" for ADHD and Alzheimer's. SID was first proposed by occupational therapist Anna Jean Ayres in the 1960s as a theory and approach to treat children with learning disability and autism. About 90 percent of children with autism have sensory integration dysfunction. While occupational therapists have viewed SID as a key to understanding autism, psychiatrists have rarely grappled

with autism from the perspective of SID. The recent rise of neuroscience changes how physicians appreciate SID, however. Neuroscience helps psychiatrists recognize SID's central place in autism in DSM5. Owing to neuroscience, moreover, SID becomes a new model for pharmaceutical companies to develop treatments. While pharmaceutical companies encounter difficulties in developing conventional biochemical drugs for mental disorders, they resort to information technology and neuroscience to develop an action video game AKL-T01 (or Project EVO), which they claim to be a digital medicine to treat ADHD by activating certain neural networks to gain therapeutic effects. To develop AKL-T01, researchers rely on the SID database collected by occupational therapists. But ironically, occupational therapists are being replaced by this game in this new recognition of SID. It would be hard for Ayres to predict in her days that SID becomes a new treatment paradigm, and leads into a video game that shifts the boundary between entertainment and treatment.

The human in the brain: opportunities and challenges in neuroscience's expanding scope *Samantha Croy, University of Melbourne*

Neuroscience incorporates a growing range of human phenomena within its research scope. This paper explores the dynamism of neuroscience as an evolving field that successfully accommodates a broad range of expertise, as well as some of the challenges that this presents. The paper focuses on the tension between the mobility of knowledge that neuroscience engenders and the difficulty of preserving the epistemic integrity of the participating disciplines. The brain that is the central object of neuroscientific investigation is conceived of as 'mind/brain', spanning molecules to mind, and can be seen to be relevant to all manner of human phenomena. This conceptualisation of neuroscience's primary object of research is an important factor in sustaining the field's ever-expanding scope, allowing neuroscience to hold together as a coherent field. Yet scholars who study interdisciplinarity in neuroscience indicate that there may be a limit to genuine reciprocity. I draw on my research that investigated how neuroscience's expansion into the study of increasingly broad, complex human phenomena was being sustained. This research included participant observation with behavioural and cognitive neuroscience laboratories in Australia, interviews with neuroscientists investigating human thought, behaviour and feeling, and textual analysis of popular neuroscience books written by prominent neuroscientists. Through this empirical work, I explore how neuroscience is an evolving multidisciplinary field organised around the human brain as its central object. I consider the material, practical and imaginative components that make up this organisation, and how these both facilitate and limit reciprocity between the disciplines that study the human.

Virtual Addiction: Is Internet Gaming Addiction Fact or Fantasy? *Gemma Lucy Smart, University of Sydney*

'Internet Gaming Addiction' is one of the most problematic psychiatric disorders to be recently proposed. In this conceptual analysis I have combined economic theory with current research in Psychiatry, Psychology and Neuroscience and Philosophical work in the area. Presented is a Neureconomic and Picoeconomic account of addiction centred on Disordered and Addictive

Gambling. I then apply this theory to the evidence presented for the proposed disorder. I argue that the broad conception of all videogaming as socially undesirable and addictive is incorrect and damaging, and that analysis from a STS perspective is well placed to make this critique. The wide scope of games and gamers can confound our understanding of the complexities of gaming. Current research into disordered gaming fails to reflect, understand or account for this diversity; the narrative of addiction provided by the psychosciences encourages gamers to self-define as disordered – both individually and as a community. I argue that by pathologising game-playing, the psychosciences are in part complicit in subjective social judgement of a particular leisure activity enjoyed by many millions of people of all walks of life, and forming an important part of the personal and social identity of many. This is contributing to the problematic framing of such behaviour as disordered. This has direct implications for the conceptual understanding of problematic gaming in Psychiatry; for clinical treatment of those presenting with problematic gaming behaviour; and more broadly for game player's self conception.

Session Organizer:
John Grant Gardner, Monash University, Australia
Chairs:
John Grant Gardner, Monash University, Australia
Cynthia Forlini, University of Sydney

041. National Identities and Transnational Science and Technology during the 20th Century: Cold War
Papers for Open Panels/National Identities and Nationalism in Transnational Science and Technology during the 20th century
Open Panel
11:00 to 12:30 pm
ICC: E3.9
Participants:

Infrastructure Wars and Media Nationalisms in Neutral Cold War Cambodia (1953-70) *Margaret Jack*
Based on research in Cambodian and US National Archives, this paper describes competing Cold War national and transnational influences on media infrastructures in Sihanouk's Cambodia (1953-1970). I discuss how shortly after Cambodian independence (1953), Sihanouk's national radio became a symbol for sovereign and neutral Cambodia. Through two cases (describing Chinese and American aid) I discuss the ways that foreign powers strategically developed media infrastructures to influence Cambodian people in the newly independent state. In the first, I describe the establishment of an American film center in the regional capital of Battambang and the dissemination of film by "cine-boat" between Battambang and Phnom Penh from 1956 and 1962. The second case focuses on the Chinese development of the Stung Mencheay radio station just outside of Phnom Penh, from 1959 to 1962. These two cases are emblematic of the way that Sihanouk let these two powers play off of each other for Cambodian interest while maintaining neutrality. I discuss the ways that their 'donated' media infrastructures were not simply 'disseminated' but taken up and made into new products by media creators in Cambodia; in fact, they made a material baseline for some of the most important cultural products in 20th century Cambodian history. I also

empirically describe and theoretically investigate the ways that these media infrastructures constructed social spaces where Cambodians watched film (cinema) and listened to radio (on the street and in markets) and where these media artifacts transformed into products specific to Cambodian culture (and nationalisms).

"The scientist the nation needs:" Early Cold War era characterizations of Turkey and Turkish scientists *Mehmet Alper Yalcinkaya, Ohio Wesleyan University*
While STS scholars have produced much work on the ways in which science and scientists are represented in public discourse, the links between such representations and the imaginations of the nation have not been studied as closely. In this paper I focus on the case of early Cold War era Turkey and illustrate how the debate on the qualities of the "Turkish scientist" that emerged in this period was part of a broader debate about the role that Turkey should play in the world and in its region. Using archival material, memoirs, and media accounts, I discuss the ways in which Turkish scientists were represented by different groups in the 1950s and the early 1960s, and show how these representations were consistently related to the ways in which scientists' identities as members of the Turkish nation were conceptualized. US experts commonly imagined Turkey as a potential leader for the Middle East, but considered that Turkish scientists needed to adopt "American" attitudes and methods to truly contribute to their nation's transformation in this respect. Turkish scientists who became members of transnational scientific networks through their activites in NATO- and US-sponsored programs, saw themselves as the "good citizens" that Turkey needed for its development, but complained that their contributions were not appreciated by their nation. Critics, however, constructed a discourse that represented Turkish scientists as alienated from the nation and its traditions due to foreign influence, and as weakening, rather than strengthening Turkey's chances of becoming a leader for the Middle East.

Transnational Science and National Identity Discourses. Cold War Astronomy in Chile in the 1960s. *Barbara Silva, Universidad Catolica de Chile*
National identities are complex imbrications allowing societies to work on social cohesion and the creation of a feeling of "belonging." In these narratives, landscapes and geography have usually been addressed combining its physical dimension with its potential to identify their population. At the same time, science and technology have historically given a sense of future for nation building projects. For Third World countries, scientific and technological features also relates to the desire of accessing the modernization paradigm. During the 1960s, a particular phenomenon took place in Chile. International holdings –Americans, Europeans, and Soviets– went to Chile and settled in the northern region of the country, the semi-arid area of the Atacama Desert, to build big-scaled astronomical observatories. By the end of the decade, they had built three massive telescopes. This scientific infrastructure drastically changed the desert's landscape. However, it also gave the country an argument to enhance the political commitment with progress and modernization, as some sort of prove of the country's exceptionalism in the Latin American context. Simultaneously, politicians started to imbricate astronomical knowledge as and evidence that the desired

modernization paradigm was taking place in the southern country. Chilean politicians and scientists gave meaning to astronomy into the national identity discourse, as an avant-garde science and technology. Until today, local agencies enhance the county as an "astronomical pole", or a "natural lab". This paper examines how an international and ideological power dispute in the middle of the Cold War intersected national identity discourses and, at the same time, broadened spatial notions of identity. Through this case of transnational science, it is possible to analyze how international politics, geographical conditions, and technological projects can converge into national discourses, reshaping both the understanding of a particular place like the Atacama Desert and traditional ideas about national identity.

Session Organizer:
Barbara Silva, Universidad Catolica de Chile
Chair:
Barbara Silva, Universidad Catolica de Chile

042. Transnational Risk and Information
Papers for Open Panels/Transnational Risk and Information
Open Panel
11:00 to 12:30 pm
ICC: E5.1
Participants:

Actuarial states: Underwriting risk in Paraguayan microinsurance *Caroline Schuster, Australian National University*

The expansion of privatized financing has had a complex relationship with public social security programs in Paraguay. This paper takes an ethnographic and anthropological approach to a development minded 'microinsurance' program that offers life insurance for beneficiaries of the state's Conditional Cash Transfer (CCT) social assistance. One of the outcomes of CCT was the state's capacity to generate information about its citizens. This has been a particular challenge for the population that qualifies for welfare - poor, often rural, communities with limited access to formal banking, employment, services, education, &c. Tellingly, existing insurance products were not available because there was not sufficient data to fully manage and price the risk. In fact, CCT was key to generating the actuarial data that underlies the pricing for policies offered by the insurer. This paper explores the effects of generating this information, tracking its movement to the Central Bank of Paraguay, to military special operations, to the global reinsurance market. As I draw out diverse encounters with risk my focus will be on its persistent "domestication" - in the double sense of a technique of governance and subjectification, but also in conversation with a wider feminist attention to the particular notions of the domestic and its distributional politics. As our appetite for and embrace of risk grows, I'll hope to persuade you of the political possibilities entailed in STS contributions to feminist studies of finance.

Information Saturation and Manufactured Risk *Gregory Leazer, UCLA Dept of Information Studies*

The transition to modernity in Europe was complex and multifaceted, and has received the attention of many scholars, including Weber and Habermas, both of whom have characterized the emergence of modernism as "the path to rationalization." The "institutionalization of

purposive-rational economic and administrative action" (Habermas 1987), had, at is foundations, new kinds of understanding of the world, and required new sources of information and evidence, not only for the development of scientific knowledge, but for the modeling and control of the world by the administrative state. While certainly reductive, one way to understand the transition from pre-modernity to modernity is in the development and communication of reliable sources of information for understanding the world. By the end of the 19th century in the United States, the proliferation of information required the development of the modern research university and the modern library. Recent political events in the U.S. and in other western democracies has pointed to a new problem: the proliferation of information has not necessarily led to wider understanding, but is also an opportunity to reap confusion by sowing misinformation, whether the misinformation is authentic error or a deliberate attempt to deceive. Bad actors have realized political gain through transnational disinformation campaigns (such as Russia's interference in various elections) and manufactured risk. Global risks, for example terrorism and climate change, require international cooperation, but these efforts are undermined by diversionary information. This paper will characterize information saturation as a possible point of inflection from modernity to postmodernity.

The Passivists: Managing Risk Through Intentional Non-Knowing *Kellie Owens, University of Pennsylvania*

In modern life, we generally manage risk through the collection of information and subsequent intervention (E.g. Beck 1992 or Giddens 1999). This approach can, for example, lead to the early detection and treatment of medical problems, or more profitable financial investments. But recently, both medical practitioners and financial experts have suggested that the collection of medical or financial data may lead to worse outcomes. In this paper, I explore the rise of intentional non-knowing in the fields of medicine and finance. In medicine, I use the case of American childbirth to trace how many medical practitioners are arguing for an ethical and moral imperative to collect less data about their patients in an effort to protect their health. In finance, I explore the "do nothing" investing revolution, where financial researchers argue that low-cost index funds are a better investment than funds actively managed by financial experts. Based on in-depth interviews with medical providers and an archival analysis of documents from financial experts, I argue that modern societies are behaving differently than many previous theories of risk would suggest. Instead of mitigating risk through the collection of information and a reliance on scientific experts, I find that some groups are seeking to mitigate risk through the collection of less information. This research integrates well-developed theories of risk and knowledge with less developed theories of non-knowledge, leading to a more productive discussion of the boundaries of responsible knowledge in risk management.

Uncontrolled Risk and Paranoia in the Practice of Information Security *Ashwin Jacob Mathew, University of California, Berkeley*

Risk – and reflexive responses to control risk – are integral to the formation of society. Nowhere are these processes more apparent than in the global infrastructures

which support modern society, such as the Internet. The stability of global infrastructures relies upon transnational cooperation and information infrastructures that control risk through definition, categorization, and regulation. However, the cooperation mechanisms and information infrastructures needed to control risk themselves entail secondary risks: for instance, cooperation mechanisms may be subject to political capture, and information infrastructures may be subject to technological failure. Secondary risks are never entirely divorced from primary risks; and under some conditions, secondary risks and primary risks may in fact be indistinguishable from each other, making it impossible to effectively control risk. In this paper, I investigate the confluence of primary and secondary risks in the field of information security, drawing from ethnographic research among information security engineers. Information security is marked by a curious contradiction: in order to secure information, information must be securely shared. For example, information about new vulnerabilities and attacks in information systems must be shared to coordinate effective transnational and inter-organizational responses, but this sharing of information must itself take place securely, to combat the risk of malicious actors gaining access to such sensitive information. As I found, the resulting confluence of primary and secondary risks leads to paranoia in the practice of information security, which makes the reflexive control of risk an ongoing and always incomplete process.

Session Organizers:
Gregory Leazer, UCLA Dept of Information Studies
Robert Montoya, University of California, Los Angeles

043. Machines and Humans: Risk, Fear and Collaboration
Papers for Open Panels/Automation and the transition to the Robotocene
Open Panel
11:00 to 12:30 pm
ICC: E5.10
Participants:

Scientific Colonization of Images of Social Robots in Taiwan *Kuan-Hung Lo, Virginia Tech*
This paper explores how the concept of "scientific colonization" affects the place of social robots Taiwanese people believe. By taking archival analysis to track news media in the United States, Japan, and Taiwan from Factiva, Access World News, and United Daily News databases, I demonstrate that the images of social robots in the United States and Japan directly influence the images of social robots in Taiwan. This process not only involves borrowing understandings and knowledge of social robots from developed countries to shape Taiwanese people's perceptions about social robots, but also represents a form of scientific colonization. Historically, Taiwan has maintained close political, cultural, and economic ties with Japan and the United States. These legacies have meant that Taiwanese media are more willing to uncritically adopt knowledge and images of social robots produced by Japan and the U.S. In doing so, the Taiwanese media perpetuates hierarchical images of social robots for their audience. This process involves disseminating westernized and scientific knowledge of social robots to Taiwan, what I refer to as scientific colonization. This process includes whether to think of social robots alternatively as hopes, threats,

friends, and enemies. This work-in-progress paper is my first step to understand how scientific colonization affects the images of social robots in Taiwan, a burgeoning market for them. The possible outcome is to better understand how the meaning of emerging robot technologies in non-Western societies is constructed.

The Making of the 'AI World Cup': Attuning to the Ideal Human-Machine Configuration *Heewon Kim, Korea Advanced Institute of Science and Technology (KAIST)*
This presentation will examine the making of the 'AI World Cup' as a new platform for human-machine collaboration as well as the attunements to concord the reality to this ideal. On December 2, 2017, the world's first AI World Cup was held at the Korea Advanced Institute of Science and Technology (KAIST) in South Korea. The AI World Cup was novel in a way that it took place inside the computer server, with the players and stadium all a part of a computer simulation program. The human participants were to submit the code that instructs the robots how to move and train themselves. Unlike previous events, such as human versus Deep Blue or AlphaGo which produced popular discourse on AI and robots as the 'confrontation' between human and machine, the organizer's idealistic vision of the AI World Cup was all about 'collaboration', which was inscribed in the design of the event. Within this vision, humans and seemingly "autonomous" machines were expected to work together to become an effective team, an effective human-machine assemblage. However, as in other AI or robot events, the organizers and participants encountered disparities between the imagination and reality in making the AI World Cup. Well-organized collaboration between human and machine, in which humans and machines remain in their own designated places and are devoted to their own roles, was not achieved in the actual game. To hide the friction behind the curtain, attunements in various dimensions of the event took place, from technical issues regarding the compatibility of computer software and configurations to more fundamental matters of Deep Learning in AI technology. These attunements resulted as the human-machine collaboration considerably attuned to its idealized form. The place where humans stand within this relationship is being rearranged by repetitive attunements and endeavors to reconfigure the agencies of humans and machines.

Vulnerability, Risk, and Humanity *Shoji Nagataki, Chukyo University*
Nature (i.e. the environment) has provided multiple benefits to human beings but at the same time it has presented many risks to them. Because of these risks, vulnerability should be considered an essential element of humanity. Human beings have been aiming at enjoying the benefits from nature while at the same time avoiding the risks by advancing science and technology. However, due to such an advancement, while some old risks have been reduced, new ones which did not exist in the past have appeared. For example, human beings are exposed to a new type of risks by implementing medical technology into their bodies. The use of rays aiming at the early detection of lesions might in turn cause new lesions, and people who have pacemakers implanted must avoid electromagnetic and, in some cases, high-frequency waves. We can think that human vulnerability is subject to transformation. In addition, the relationship between

humans and a new generation of robots and AI by means of new digital technologies is becoming problematic. Some people are afraid that human labor will be negatively affected by the newcomers. This situation may also be said to be a manifestation of human vulnerability. In this presentation, I will discuss vulnerability as part of human nature and its transformation in light of new risks given by science and technology from a (post)phenomenological perspective. In discussing such vulnerability, I will also show that it may be problematic for human beings to actually coexist with the newcomers

Towards a Sociology of Ontological Reflexivity. *Céline Borelle, Orange Labs*

What types of interactions are formed with artificial agents? How can sociology study these interactions? Can they be apprehended as a simple simulacrum of human interactions? Can they be considered as a place where relationships are established? This paper intends to make an inventory of the works that can be mobilized in social sciences and to propose a new orientation to build this object of research. First, we show how it is possible to rely on several works that question a dualistic approach to constitute ontology no longer as a goal but as an object of study. These works invite us to investigate the ontological determination of hybrid beings, which leads us to discard the objective of distinguishing between human and machine. Secondly, we emphasize how the operations of ontological determination are intimately linked with the concern to find adjusted modes of cohabitation. We underline the importance of experimental interactions with hybrid beings, as well as the ways in which these interactions are likely to reconfigure our attachment modalities and lead us to develop relational creativity. Finally, we intend to enrich these works by paying more attention to the ontological reflexivity of actors. From a perspective of pragmatic sociology, we propose to follow the investigations conducted by the actors to qualify the world, focusing in particular on the ways in which they constitute the social as an object of investigation. This raises the question of both ordinary and specialized practices that naturalize/denaturalize the social world.

Automating the Braille Embossing Machines of the Benjamin Constant Institute *Marcos Fialho Carvalho, UFRJ - HCTE; Marcia Cristina Andrade Soeiro, HCTE-UFRJ / NCE-UFRJ; José Antonio Santos Borges, HCTE-UFRJ / NCE-UFRJ; Eduardo Nazareth Paiva, EDUARDO NAZARETH PAIVA*

In 1983, the Benjamin Constant Institute, Brazil's largest Braille production center, acquired three large - scale production Braille embossing machines (Puma - Blista Brailletec gGmbH), a complex German electromechanical technology that was assimilated as black box in the institution. A group of highly trained people operated these equipment, and maintained with them intense psychological relation. Ten years later, computerized Braille printers were purchased for small print volumes, and software was created that automated production. Its operators had less expertise because the software provided the technical aspects of transcription. Computerized production was quick and simple. It would therefore be convenient to integrate embossing machines into the computerized production chain. Buying new models of Braille embossing machines would be ideal, but there were no resources, including major adaptations in the printing system to incorporate the new machines.

But a major problem was the loss of status of technical experts. The solution was to create, with Brazilian technology, a robot digitizer that pressed the machine buttons, attending the computerized commands. This robot could be replaced by humans, valuing human expertise in more complex situations. This solution gave the Pumas a four-year survival, allowing the importation of new machines to be postponed, and minimizing human problems. When the import happens, the solution is destabilized, and the robot dies. But it is not a death at all: it exhibits a historicity that influences other (i) materialities already expected, but unequally (in) desired.

Session Organizer:
Roger Andre Søraa, NTNU
Chair:
Adrian James Wright, University of Hong Kong

044. How Do STS Studies Translate Numbers: Economics, Markets Value/Valuation and Policy
Papers for Open Panels/How do STS Studies Translate Numbers
Open Panel
11:00 to 12:30 pm
ICC: E5.2
Participants:

Doing the Undoing of Number: The Decimalisation of Currency and STS *Chris Vasantkumar, Macquarie University*

My paper explores media depictions of the decimalisation of currency in Australia, New Zealand, the UK in the 1960s and 1970s in order to think through some salient ironies of the relationship between number and what Helgesson and Muniesa (2013) term "the contingent circumstances that allow… for the construction of the objectivity of value." In particular, it describes how number was undone and redone in a series of short films designed to prepare citizens for the transition from the Carolingian composite base-12 and base-20 framework of pounds, shillings, and pence to the now ubiquitous decimal money-number system. Focusing simultaneously on the framing of the logic behind this transition and the role of demonstrating new modes of doing number in its explication, I examine how the apparently objective and efficient functioning of number was made to stand in for the changing global political-economic topography that actually occasioned the shift to decimal money. Such a focus foregrounds the degree to which the relationship between number, value, and objectivity is contingent and historically specific rather than natural or necessary. While decimalisation was (and is) presented as the ultimate "no brainer," the redoing of number it entailed was shot through with historical, material, and moral contingencies and specificities. Ultimately, this realization suggests that the questions we should be asking of the transition to decimal reckoning are less about the natural and inevitable unfolding of increasing objectivity, than of what needed to be trans-[formed/lated/figur]ed in the process.

The Multiplicity of Metrics in Climate Change Mitigation Targets, Efforts, and Actions *Mark H Cooper, University of California, Davis*

Climate change is commonly characterized as a problem of numbers. The key issue can be portrayed as one of gigatonnes, degrees, dollars, citizens, kilowatts, and so on, depending on how one wishes to frame the problem. Likewise, when governments, industries, social

movements, and others construct targets and action plans for climate change mitigation they inherently foreground particular numbers and metrics. This paper examines the role of these numbers and metrics in climate change mitigation and their use in mitigation targets and action plans through the concept of multiplicity. The mobilization of particular numbers and metrics arises from – but is also the source of – competing political commitments, values, and interests. Using selected cases of national mitigation targets and Nationally Determined Contributions I demonstrate how recognizing and articulating the diversity and incommensurability of metrics through which climate change mitigation is construed offers an entry point to better understand the existing terrain of climate politics and alternative futures. In climate change, and in other domains, multiplicity can be unbundled through both quantitative and qualitative distinctions, measures, and metrics. These individual distinctions, however, seldom remain distinct for long; rather, they are combined with other distinctions to form metrics that are multiplicities of a different kind. This presents what I conclude is a fundamental paradox of governing through metrics: simplification is complicated, and the singular can rapidly become exponential.

Numbering As Landscape-making. *Annika Capelán, Lund University*

This paper draws on an ethnographic study on sheep and wool production in Patagonia, South America, which includes fieldwork on measuring wool in a laboratory. This measuring implies translating the quality of woollen fibres into numbers, in turn read as exact data – facts – about the wool. Early STS caught issue with how scientific facts are made into 'objective' and 'universal' knowledge in practice by drawing on ethnographies of laboratory studies. In much thanks to this, facts have been localized (Law and Mol 2001). We now accept that facts are always produced somewhere; that they are situated (Haraway 1991). This paper is driven by a search for the wheres of the numbering activities and the wheres of their impact. It shows that the meticulous numbering of woollen fibres (the quantification of its quality) while explained as a mere translation of what is already in the fibre, also shapes the wool, and subsequently, makes the geopolitical landscape where the wool grows. Yet, for the data to be taken as facts, there is an expressed conflict between the numbering activities and the shaping and making of wool and landscape. What stands out is how this conflict is not taken as problematic by the lab technicians. Instead, there is room for 'double visions' on wool as 'subjectobject'. The paper argues that, in the practice of wool measuring, acts of numbering links quantitative and qualitative versions of wool; that these versions are sometimes allowed to work together; and that when they do, they form part of landscape-making.

Datafication as a Political Technology: Translating International Benchmarking in US Federal Education Discourses *Roberto de Roock, Nanyang Technological University; Darlene Machell Espena, Nanyang Technological University*

The examination, in its quantification of the child, has long been a fundamental technology in education (Foucault, 1979; Ozga, 2008). However, students (along with their teachers and communities) are increasingly subjected to numbers and rendered numbered subjects (Ball, 2015) through international educational benchmarking such as PISA, which has become an obligatory point of passage (OPP; Lascoumes & Le Galès, 2007; Law, 1986) for educational policy-making (Carvalho, 2012). This paper analyzes US federal policymaker discourse on and data practices around international standardized assessments during the Obama Administration, focusing on Singapore and other high performing systems. While the general assumption (and expectation) is that educational policies and reform are steered by big data sets generated, processed, and authenticated by key global testing regimes, US educational policy makers are neither predominantly nor deliberately driven by data. In fact, the most salient of these (translational) data practices have very little to do with robust leveraging of the data itself, as they are devoid of intensive research practices or analyses. In establishing and perpetuating benchmarking as an OPP, policymakers translate (Callon, 1984) numbers and rankings into problems while reinforcing their authority (Asdal, 2011) to present inevitable (neoliberal) solutions; such doing of numbers (Espeland & Stevens, 2008) is always situated, traceable to the unfolding of translational processes (e.g. in attacks on teacher professionalism and unions). Data are mobilized to either justify or advance policy assemblages steered by neoliberal governmentality (Foucault, 1991), particularly the ongoing shift from a so-called welfare state to a competition state (Cerny, 1990).

Escaping Numbers? Intimate Accounting, Informed Publics and the Productions of Authority and Non-Authority *Radhika Gorur, Deakin University*

Recent decades have seen a significant rise in the use of numeric evidence in education policy and governance. Using the case of the Education Revolution in Australia, and based on the analysis of policy documents, ministerial briefings and media reports, this paper explores the processes by which both 'distant accounting' and 'intimate accounting' were made possible by new national assessments and a public website containing comparative information about schools' performance on these assessments. Building on Asdal's (2011) concepts of intimate actions in accounting, the paper elaborates how Australian regulatory authorities created new intimacies by compelling schools to reveal intimate details publicly and brought new alliances of intimacy into being. Parents came to be seen as deserving of such information, and as capable of using such information appropriately. The resulting 'informed publics' participated significantly in challenging the authority of numbers by subverting the efforts of quantification and refusing the numbers that were nevertheless produced. Tracing the story of the Education Revolution affords an opportunity to elaborate the processes of 'accounting intimacy' suggested by Asdal and to examine the relationship between 'the production of non-authority,' the production of non-calculation suggested by Callon and Law (2005), and the concept of 'informed publics' conceptualised by Callon et al (2009). The paper proposes that 'distant' and 'intimate' forms of accounting are not mutually exclusive, but can operate simultaneously and even reinforce each other, and it describes how this was achieved in the Education Revolution.

Session Organizer:
  Radhika Gorur, Deakin University
Chair:

Helen Verran, Charles Darwin University, Casurina, NT

045. Flammable Futures: Encountering Combustion in a Changing Climate 2

Papers for Open Panels/Flammable futures: encountering combustion in a changing climate
Open Panel
11:00 to 12:30 pm
ICC: E5.3
Participants:

Risk landscapes: a new nature requiring a new expertise *Nicholas B. de Weydenthal, The University Of Melbourne, Australia; Dean Pierides, University of Stirling*

This paper examines how environmental governance in Victoria, Australia has shifted from managing natural resources to managing risk. Natural resource management (NRM) regions have been developed over the past 20 years. The establishment of NRM as an administrative order fostered new measurement techniques, knowledge practices and expertise that were led primarily along disciplinary lines. Recently, a new administrative order has been established that reconfigures NRM regions into risk landscapes. In this new regime predictive, probabilistic simulation technologies are used to reconceive the landscape and to effect interventions in nature. The production of risk landscapes involves the intricate layering of maps (e.g. key infrastructure assets, private property, ignition threat, tree cover) in order to pinpoint sensitive areas and trigger points that are to be addressed through environmental resource and financial management decisions. Paradoxically, by making risk mitigation the focus of environmental management disciplinary expertise becomes secondary; it becomes a question of asset management and stocktaking. We argue that in this new regime scientific expertise actually neutralizes itself in turn opening up a space that requires a new politics and a new form of critique.

Standardizing Firefighters: WFX-FIT, Bona Fide Fitness Requirements, and Fungibility in Wildfire Management *Eric Kennedy, Consortium for Science, Policy, and Outcomes - Arizona State University*

Wildfires are an inalienable feature of landscapes around the globe. Major recent conflagrations in Australia (2009 & 2016), Canada (2015-2017), Chile (January 2017), and the United States (December 2017) serve as reminders of the perennial presence of fire, as well as the ways in which human choices (like settlement patterns, construction and maintenance procedures, and fire suppression) can have devastating consequences. Humans also make significant choices about how to fight fires, including the fire management institutions we build, the tactics and resources we employ, and the way we train firefighters. One defining element of firefighting is its exceptionally physical nature. Firefighters are expected to have and maintain a high level of physical fitness. Defining, quantifying, and assessing this fitness, however, is a contentious topic that has resulted in significant legal challenge and financial costs for fire agencies. In this paper, I explore the evolution of physical fitness standards for firefighters in Canada, including historical antecedents, a series of legal challenges in 1999, and the resulting nation-wide "WFX-FIT" program. Using theories from the social studies of science as a way of exploring the consequences of imposing standards and

legibility, I explore the ways in which fire managers attempt to make their firefighters homogenous, quantified, and fungible for the purposes of emergency response. In particular, I examine the contingent history of how the provinces to establish their own cut-off fitness levels as an example of how systems of standardization can be 'gamed' by the very agencies they were meant to support.

Mountains Of Uncertainty: Politicised Ambiguity, Blame and Philippine Forest Fires *Will Smith, Deakin University*

The causes of uncontrolled forest fires in the mountainous uplands of Southeast Asia are highly contested. Both popular and scientific accounts of recurrent forest fires often identify a bewildering array of actors whose irresponsible behavior could potentially contribute to disaster. However, while fire is used to aid the permanent conversion of forests by commercial plantations and expansionary migrant farmers, the blame for fires throughout the region is routinely placed on indigenous swidden cultivators who annually burn sections of forest for crop production. This disproportionate blame placed on swiddening peoples operates in the context of limited systemic knowledge of forest fires, and tropical forest ecologies more broadly, in Southeast Asia. Such spaces of intense epistemic uncertainty intersect with regional political economies in which blaming indigenous farmers for varied forms of forest degradation continues to enable the appropriation of valuable lands for agricultural intensification and commodity production. Drawing on ethnographic insights from swidden farmers and recent histories of forest fire governance in the Philippines, this paper demonstrates how the unruly and often spatially distanced nature of montane forest fires produces highly politicised spaces of uncertainty in which older prejudices against indigenous resource use are reworked and sustained.

Session Organizer:
Timothy Neale, Deakin University
Chairs:
Lauren Rickards, RMIT University
Timothy Neale, Deakin University

046. Beyond Boundary Objects and Immutable Mobiles - New Ways of Thinking about the Movement of Knowledge II: Mediators of Knowledge

Papers for Open Panels/Beyond boundary objects and immutable mobiles: new ways of thinking about the movement of knowledge
Open Panel
11:00 to 12:30 pm
ICC: E5.4

Knowledge has been a central focus in Science and Technology Studies for quite some time, in particular its production and dissemination. To talk about the latter, STS scholars have developed concepts like boundary objects, immutable mobiles, and trading zones; concepts that draw attention to the knowledge objects that offer flexibility or stability or are being exchanged. This open panel explores new and other ways of in detail tracing the everyday practices, structures, and relations that make knowledge travel from one site to another. This session adresses important aspects of mediators of knowledge.
Participants:

Between Standards and Wilderness: Boundary Jumping as Epistemic Practice in Urban Transport Planning *Ivana Suboticki, Norwegian University of Science and Technology*

This paper is about epistemic practices of transport

planners in Belgrade, Serbia. Serbia is in midst of EU accession reforms that require planners, politicians and administrative workers to change their epistemic practices and the devices they use in city planning and development. Based on 25 interviews with actors involved in transport planning, I explore how and what epistemic authorities are generated in this changing landscape. In specific, I focus on the strategies planners use to deploy their knowledge authority in bureaucratic and political arenas. On one side, I find that they are fighting to avoid copy – paste knowledge transfer often connected to implementation of new standards in planning. On the other side, they are trying to avoid following narrow political interests that do not account for the planners' professional authority. The planners use a broad set of strategies to gain authority in this polarizing environment. Their attempts to create trading zones for negotiation and use boundary object such as maps and strategies is often failing in this endeavor. What I find is that planners are also working as boundary shifters (Pinch and Trocco 2002, Pinch 2008). Being a boundary shifter means that they take on several roles to deploy some of their expertise. However, in Belgrade's planning circles this role seems to be pushed even further. Planners are not merely shifting, but sometimes 'jumping' between these identities and social worlds. In this process, they continually adapt their values, planning criteria, and epistemic practices.

Adopting, Adapting and Putting into Practice: Translating Knowledge for Profitability *Hannah Grankvist, Department of Thematic Studies - Technology and Social Change, Linköping University*

In Science and Technology Studies movement of knowledge has been a central focus for quite some time, in particular how knowledge objects travel from one site to another. However, how knowledge is brought to users and integrated into their practices is just as important. In spite of the users' central role in turning theoretical knowledge into active practice, these mediators and their intersection between theory and practice have not been studied. Paying attention to mediators shed light on the adaptations and translations between knowledge and practice that make knowledge usable and useful. In this paper I turn the attention towards mediators and analyze how knowledge is transformed or not transformed into practice in an arena of conflicting interests. More specifically, I investigate how occupational health practitioners, as mediators, in Sweden adopt, adapt and put into practice scientific knowledge. Occupational health services is a practice where scientific knowledge meets with societal and work place demands. Given this, occupational health practitioners must take practical, financial, and power-related factors into considerations when turning theoretical knowledge into practice in their everyday work. Through ethnographic fieldwork, in order to capture mediators' perspectives of their work, I analyze the practices, structures, and relations for integrating and translating knowledge into a practice that requires adaptation and translation to a case's individual circumstances, thus, going beyond boundary objects and immutable mobiles.

Making Knowledge Accessible and Palatable: Midwifes Offering Parental Advice to Parents-To-Be *Jenny Gleisner, Department of Thematic Studies - Technology and Social Change, Linköping University*

How does scientific knowledge become practice? Moving and translating knowledge from one context to another has been of interest in Science and Technology Studies for quite some time. This research project studies a context where professional and organizational guidelines in large extent affect what kind of knowledge is considered valid and appropriate but also peoples' feelings and requests. By looking at a seemingly voluntary activity such as parental education, this research project shed light on new and other aspects that affect the movement of knowledge. This paper is based on an ongoing research project that studies how midwives as mediators of knowledge make evidence-based knowledge and guidelines accessible and palatable to parents-to-be during parental education. The project is situated in Sweden where midwives oversee pregnancy check-ups, organize parental education, and support women during childbirth. In these situations, midwives are the experts who mediate, package and translate medical knowledge to laypersons, the parents-to-be, who bring their own understandings and feelings to the encounter. Through qualitative interviews with midwives, the project explores how midwives reason about how to talk about knowledge with the parents-to-be about such a personal and intimate practice as childcare.

Kill Your Darlings: Advertising, Expertise, and Commercially Elicited Knowledge *Iddo Tavory, NYU*

Based on fieldwork observations in a large advertising firm, this article examines the forms of expertise developed by producers of "commercially elicited knowledge"— knowledge constructed as part of a commercial project, and that serves a commercial end. Focusing on the work of "account planners," the article shows how the organizational structure and temporalities in an advertising firm make both campaign ideas and knowledge claims highly fragile. The article then shows that an important part of such knowledge producers' expertise is the ability to oscillate between pulses of attachment and detachment—where at one moment they treat their data and claims as given and fixed and at the next they cogently explain how they were constructed, and why the categories and methods through which it was composed are suspect. Doing so, the article argues that the sociology of knowledge should focus more attention on the experiential relationship of experts to the knowledge they produce, and shows the utility of treating some of the laboratory-elicited theoretical terms used in such work as axes of variation rather than as descriptive theoretical terms.

Session Organizer:
Hannah Grankvist, Department of Thematic Studies - Technology and Social Change, Linköping University

047. STS Underground: Governance, Deliberation and Expertise
Papers for Open Panels/STS Underground: Investigating the Technoscientific Worlds of Mining and Subterranean Extraction Open Panel
11:00 to 12:30 pm
ICC: E5.5
This is one of three sessions that aim to bring together international scholars whose work addresses technologies, practices, and forms of knowledge related to the subterranean, including the mining of minerals, groundwater and fossil fuels. This session examines

issues of governance, deliberation and expertise across examples from all over the world.

Participants:

Conflict and Collaboration in Urban Hydraulic Fracturing: A Closer Look at Mechanisms behind Effective Collaboration *Frances Marlin, Colorado School of Mines, Civil and Environmental Engineering Department; Jessica M. Smith, Colorado School of Mines*

Conflicts over natural resource management in the Western United States have become increasingly 'wicked,' leading policymakers to seek more participatory and collaborative governance approaches to development. Governance of unconventional energy development along the Colorado Front Range is no exception to these trends, and both citizens and scholars are calling for more participatory policy methods. With power in the debate heavily skewed toward the state and industry, communities concerned over development in proximity to their homes have turned to their local governments for support. The Land Use Review Committee, which was established by Commerce City in response to conflict over prospective development in their community, mirrors many of the state's other collaborative governance schemes. In this paper, we seek to evaluate how existing power differentials among the committee members – as they are inflected by what scholars identify as the 'politics of resignation' (Benson and Kirsch 2010) and the inevitability syndrome (Hughes 2017; Nader 2010) – influence the committee's negotiation process. This analysis is supported by observations of all six of the Land Use Review Committee meetings as well as key stakeholder interviews. We analyze these meetings and interviews to identify ways in which power on the committee, in the form of expertise, is both enacted by 'experts' and contested by citizens who are deemed 'non-experts.' Through this analysis, this paper ultimately seeks to identify the mechanisms behind both effective and ineffective collaboration in order to better inform policy decisions.

Learning to love an old enemy: the future of coal when it's no longer a fuel. *Paul Frederick Brown, School of Humanities & Languages, University of New South Wales, Sydney, Australia*

This whimsical paper may be more important than you think. Why are hipster travellers reclaiming the Illawarra as the 'Coal Coast'? What are the alternate readings of politicians' use of coal as a prop for parliamentary debate? What are the intrinsic properties and characteristics of coal that might make it one of our favourite rocks – after we've stopped warming the planet with it? Starting with a geologist's assessment of its components and microscopic structures, this paper considers the values society may ascribe to coal once it's no longer our worst enemy. Coal strata is responsible for dramatic shaping of our landscape (not least the Illawarra Coast) and, as a soon-to-be-retired industrial material, coal has inspired equally dramatic shaping of our corporate and labour history. Its 'macerals' are beautiful under the microscope, so perhaps we should familiarise ourselves with vitrinite, liptinite and inertinite varieties – these components of coal are fossil leaves, remnant pollen spores and algae, metamorphosed roots, branches, and even buried tree trunks. In other words, as a 'seam' coal is a graveyard for ancient forests, heath lands and wet lands – thus deserving of our respect. With that

respect comes renewed appreciation of 'the underground' as a place no longer to be bored, shafted, driven, roomed and pillared, long-walled, quarried, and backfilled with muck. There is much to love about coal, and we'll need to think of it differently in a post fossil-fuel age – even as we remember it can still catch fire spontaneously.

On gravel - materialities of development and expertise in Northern Australia *Kirsty Howey, University of Sydney*

Gravel is not the first material that comes to mind in debates about resource extraction in northern Australia. Attention is usually focused on large and controversial developments and their unstable relationship with Indigenous property rights and the environmental movement (Neale and Vincent) – coal mines, uranium mines, rare earth mines, and shale gas exploration and production using "hydraulic fracturing" processes. But this quotidian resource is ubiquitous in the north – gravel is the key material scaffolding the bulk of the Northern Territory's remote road network (which is itself described as an essential agent of more and better "northern development"), and searing heat and monsoonal deluges in the tropical north mean demand for it is unceasing and likely to increase with the infrastructural impacts of climate change. But, like larger scale subterranean extraction, obtaining and utilizing this apparently apolitical extractive resource conceals a web of regulatory regimes, scientific debates, environmental impacts, Indigenous land access issues and development controversies. In this paper, I reflect on recent ethnographic research with some of the "experts" associated with gravel extraction in the north - staff at the Northern Land Council, the Indigenous organisation tasked with responding to applications for gravel extraction agreements on Aboriginal land owned under Aboriginal Land Rights (Northern Territory) Act 1976 (Cth). I explore what an analysis of gravel, including the role of expertise in its extraction and utilization, can tell us about the often vexed interface of Indigenous land rights and development in the north of Australia.

Session Organizers:

Roopali Phadke, Macalester College

Abby Kinchy, Rensselaer Polytechnic Institute

Chair:

Roopali Phadke, Macalester College

048. COMPOSTING Feminisms and Environmental Humanities 2: Art and Practice

Papers for Open Panels/Composting Feminisms & Environmental Humanities

Open Panel

11:00 to 12:30 pm

ICC: E5.7

Imagine the process of reading and writing as composting. Matters break down and re-emerge as new matters. In the spirit of a feminist politics of citation, how might we attune ourselves to the ways in which new ideas are always indebted to writings, readings and practices that have come before? What and how are feminist genealogies composted in and through the Environmental Humanities? What concepts are especially fruitful, and why? In what forms do these ideas re-emerge? How are these genealogies acknowledged? What ideas are yet to be added to the Science and Technology Studies (STS) compost pile? Composting, as a feminist practice, has been taken up by a University of Sydney-based reading and research group of cross-institutional, trans-

disciplinary scholars exploring the traces, legacies and intersections between inclusive feminisms and broad Environmental Humanities. Started by Dr Astrida Neimanis and Dr Jennifer Mae Hamilton in September 2015, the Composting Feminisms and Environmental Humanities group wishes to connect with transnational composting kin through this open panel at 4S. STS & Environmental Humanities share many key feminist interlocutors and this panel is an opportunity for discussion of similarities and differences.

Participants:

When plants design: multispecies entanglements in a transcultural Sydney neighbourhood *Ilaria Vanni Accarigi, University of Technology Sydney; Alexandra Crosby, University of Technology Sydney*

In this paper we consider the migration of the idea of 'edge' or ecotone, intended as the encounter of different ecosystems, from ecology to humanities and design disciplines. Edge as a method enables us to focus on systems, beings and things as they meet, remix, and generate new and highly bio-diverse constellations. The particular edge we present here composts two genealogies. The first one is the transcultural vein that traverses globalised landscapes and gives us a critical toolkit to read instances of disruption and micro-resistance to colonial, neocolonial and globalised dynamics. We refer in particular to Silvia Spitta's writing on misplaced objects: moving from one cultural context to another as a result of colonialism or globalization, these objects generate epistemological rifts and disruptions in the existing order of things. The second genealogy arrives to us via Sarah Whatmore and Steve Hinchcliffe's work on the entanglement of the social and natural in urban contexts. Cities host heterogenous inhabitants and involve associations and attachments between humans and non-humans, against the grain of human-centred design (for instance birds use buildings as they see fit and not as architects intended). Building on these genealogies we propose the concept of multispecies design to make present how the natural and the social come together and intervene in the design of urban edges. We present work we did along edges in Sydney's Inner West, guided by three misplaced plants: bananas, papayas and dragon fruit. We will also make available maps of our walks and invite conference participants to go along and map edges. Hinchliffe, S. and Whatmore, S., 2006. Living cities: towards a politics of conviviality. Science as culture, 15(2), pp.123-138. Spitta, S., 2009. Misplaced Objects: Migrating Collections and Recollections in Europe and the Americas. University of Texas Press.

That new carpet smell: Chemical kin-making *Susanne Pratt, University of Technology, Sydney*

In dominant American and European narratives, kinship is typically traced by biological "blood" ties, such as parent and child or marriage/law. McCarthy and Edwards (2011) note that historically, kinship "refers to formal systems of relationships with regard to alliances of marriage and lines of descent" often valuing biological reproduction. However, contemporary understandings see kinship also denoting wider family connections. Haraway (2015) stretches the practice of kinship further. According to Haraway, "kin-making is making persons, not necessarily as individuals or as humans." For Haraway (2016), making kin is a process which requires sympoiesis, or making-with, rather than autopoiesis, or self-making. She

writes, "making kin and making kind (as category, care, relatives without ties by birth, lateral relatives, lots of other echoes) stretch the imagination and can change the story" (2015). How might making kin and making kind with toxics, and others within chains of exposure, change the story? Toxics such as volatile organic compounds (VOCs), including the evaporation of formaldehyde from carpet. How might kin/esthesia, or imaginative indices for sensing and tracing toxics movement through bodies and across kin empower different accountabilities and move from individualistic damage centered narratives? Writing through a chemical frame, Agard-Jones (2016) emphasizes that chemical exposure emerges as another form of kin-making, and explicitly refers to the affinities that are formed by those that share chemical exposure as "chemical kinship." Arguing that it is through the circulation of chemicals and associated narratives about "contamination, accountability and communities of chemical injury" that kinships are formed. This paper explores chemical kin-making through a reflection on artworks that highlight shared modes of sensing toxicities, reflecting specifically on VOCs. As Haraway states, "staying with the trouble requires making odd kin."

Studio/Kitchen/Pile: Composting with contemporary art practices *Lindsay Kelley, UNSW Art & Design*

Domestic composting often starts in the kitchen. This paper explores how contemporary art made or staged in the kitchen provides fertile terrain for exploring how art practices might form aerobic connections between environmental humanities and feminisms. The kitchen is a fraught site for both disciplines. Our food and culinary environments have global implications, making food and eating of critical concern for the environmental humanities. Women's roles and place in the kitchen have been troubled, emancipated, and critiqued by feminist thinking. Before women had full access to higher education, home economics kitchens served as laboratories for scientists unable to pursue science degrees, yet home economics was derided by second wave feminisms. Plunging into this complex heap, contemporary artists have found the kitchen to be a vital space for critique and production, mixing and turning everything from hormones to sauerkraut. How might art practices in the kitchen complicate and decompose connections between feminisms and environmental humanities? Starting with historic tensions embedded in the kitchen, this paper will turn to close readings of kitchen art practices, including Mary Maggic's Housewives Making Drugs (2015-ongoing), Beatriz da Costa's Anti-Cancer Survival Kit (2015), and works from Lauren Fournier's "Fermenting Feminisms" series, including Leila Nadir and Cary Peppermint's Probiotics of the Kitchen (2017). These practices will then be put in dialogue with the author's own kitchen installation at the Human Non Human exhibition at the Powerhouse Museum, Food, on display during and around the corner from the 4S conference.

Disruption and (Dis)Location: A Mediated Performance for Writing-With the Anthropocene *Lissa Holloway-Attaway, University of Skövde*

In "Writing the Anthropocene: An Introduction," Boes and Marshall explore the contradictory role of the Humanities in the Anthropocene, where the human voice—the unified author at the center of traditional

Humanistic inquiry and critique—is displaced in favor of more-than-human discourse. If we are to dethrone the human subject, the site from which writing traditionally derives, to make way for the earth to express its own geological epoch, how shall we write and what voices will be mediated? Boes and Marshall, suggest we must find "alternative narratives," other modes of mediated composition where our "contemporary species-being expresses itself not in denotative speech acts but rather in performative interventions (64)" In this way, "humankind functions as both subject and object" of the discourse, becoming a sender and recipient, and all ways in between (64). A compost pile of many matters. Such composting (and composing) is a particular challenge for the Environmental Humanities where modes for writing-with (rather than about) our piles, keep us in states of disruption and decay, voiceless with so much to express and release. Here scientific inquiry and technological innovation (particularly digital communication modes) are suspect tools for mediating our state(s) of being. We must instead embrace new forms of material inscription that reflect our elemental bits (and bytes). Both to reveal this material struggle, but also to performatively intervene and participate in this necessary disruption of authorship, I offer a mixed media reflection, presented and composted with live spoken word, digital imagery, and weather-based data streams. Focusing particularly on my own locale (in western Sweden), I hope to demonstrate how personal, intimate contact with our specific earthly locations and genealogies, and enabling their expressive release, offers a critical framework for other more global connections to more-than-human writing. Reference Boes, Tobias and Marshall, Kate. (2014). "Writing the Anthropocene: An Introduction," in The Minnesota Review 83: 60-73.

Session Organizer:
Lindsay Kelley, UNSW Art & Design

049. Science, Technology, and the Regulation of Food and Agriculture #2

Papers for Open Panels/Science, Technology, and the Regulation of Food and Agriculture
Open Panel
11:00 to 12:30 pm
ICC: E5.8

Food and agricultural production have long been shaped by scientific and technological innovation. Technologies designed to increase crop yield, produce novel traits, maintain biodiversity, and improve the global transport of goods significantly transform the food ecosystem from production and processing to transport and consumption. Simultaneously, these transformations prompt new regulations that often evoke broader ethical concerns about the future of food. Today, almost every technological innovation in food involves some type of novel regulatory response. These regulatory interventions not only shift how people access, interact with, and understand food, but also iteratively transform the spaces in which techno-scientific innovation takes place. This panel explores how the science of food and agriculture intersects with emergent regulatory regimes. Regulation may refer specifically to the law and its application, but might also encompass the institutional practices that shape scientific research, the organization of agricultural production, or the socio-cultural norms that determine what foods can or should be eaten. Some of the questions that might be asked include: How has intellectual property – from patent and plant variety protection through to trademark and trade secret law – reconfigured contemporary food production? How are foods categorized, packaged, and labelled, and how do those regimes shape the materiality of the food itself? What do new developments in biotechnology and gene editing mean for key regulatory food categories like 'GM' or 'organic' food? What resources are available for local communities to resist or reconfigure the regulatory landscape in a manner suitable to their divergent needs?

Participants:

"Except Musa textilis": Navigating Access to Plants in a Post-Treaty World. *Xan Sarah Chacko, Ms.*

The International Treaty on Plant Genetic Resources for Food and Agriculture (Treaty) was adopted in 2001 and currently has 144 signatories. The Treaty was created to facilitate the free exchange of thousands of varieties of 64 major crops for farmers, breeders, and researchers. As the most recent regulatory instrument for plants, the Treaty was intended to reconcile past grievances of benefit sharing and intellectual property rights by requiring members to provide access to any requested materials with the guarantee that no intellectual property protection could be sought for novelties derived from shared material. Why then have all member-states not behaved as the Treaty had hoped they would by facilitating free and open material exchange? Why do plant breeders in some institutions find themselves languishing in the isolation of their own limited collections? Who, if anyone, has benefitted from the Treaty and to what effect? In this paper I focus on the effects of the Treaty on one area of plant and agricultural science: conservation in seed banks. I present results from interviews conducted with scientists at five seed banks on four continents during 2015-17. I will explore the post-Treaty sui generic systems that have been created to facilitate material exchange by institutions that have the wherewithal to do so. Comparing strategies from sites that have varying financial and bureaucratic capabilities, I show how the Treaty not only fails at its basic mission of providing access, but also creates particular hindrances for scientists in the developing world to perform their work.

Combatting Illegal, Unreported and Unregulated Fishing: National Boundaries and International Trade *Sonia Garcia Garcia, University of Technology Sydney*

Fish is a common-pool resource and one of the most traded foods worldwide. Trade is one of the main pressures on the ecological and economic sustainability of the resource and a driver of illegal, unreported, and unregulated fishing (IUU). IUU has been demonstrated to have negative environmental impacts, produce economic losses, and threaten food security. Until recently, prevention of IUU has relied mostly on measures undertaken at the national level, such as monitoring, control, and surveillance systems for vessels in sovereign waters. The main limitations of this approach are the diverging capacities of states to manage their fisheries and the importance of fishing in the high seas beyond any national jurisdiction. More recently, market access and trade measures have started to be explored in some countries, shifting the locus of deterrence from the act of fishing to further stages along the supply chain. This shift also reflects a change in the framing of IUU as a problem and can therefore be studied using methods of discourse analysis: How are regulatory interventions such as labelling, catch documentation or traceability schemes

justified? What discursive practices enable or hamper this shift? The Australian case shows how the framing of policy problems determines the measures that will be adopted towards their solutions, and how this framing is a result of competing normative conceptions regarding markets, regulation, trade, the role of science, and the defence of national borders.

Regulating the Circulation of Intangibles: End Point Royalties, Intellectual Property, and Transformations in Food Production *Susannah Chapman, Law School, The University of Queensland*

This paper explores the relationship between emergent regulatory regimes and changes in the plant breeding sector through attention to a shift in the ways that royalties are collected for intellectual property-protected crop varieties. In the late 1990s, the Australian plant breeding sector adopted a system of end point royalties (EPRs) in the hope that changes in royalty structures could solve a problem that has been a longstanding concern of intellectual property owners: that is, how to track and profit from the circulation of protected objects as they move within the economy. Whereas royalties on biological property have traditionally been collected on the sale of planting material, EPRs entail the collection of royalties on the sale of the harvested material. The rationale for their adoption was that EPRs would generate more money for plant breeding by lowering seed costs and reducing revenue losses from farmer seed saving. While this regulatory shift reworked the movement of protected plant varieties among varietal owners and various end-users, it also raised new concerns about how to trace protected varieties as they circulate along the agricultural supply chain. In this paper I address some of these concerns as they have unfolded within the Australian mango industry. Drawing on interviews and research with various actors in the mango production chain, I show how intellectual property owners have relied upon a variety of social, legal, and technological strategies that have reconfigured food production practices as well as the object of patent and plant variety protection.

UAV Technology and its Issue of Governance in Indian Agriculture: A Responsible Innovation Perspective *Anjan Chamuah, Centre for Studies in Science Policy, School of Social Sciences, Jawaharlal Nehru University*

In this era of globalisation, emerging technologies are trying to provide a solution to almost every problem of human life and their surrounding ecosystem. However, the arrival of these problem-solving technologies also raises questions about their efficiency, validity, reliability and sustainability (social, economic, environmental). This paper is an attempt to study Unmanned Aerial Vehicle (UAV) technology and its deployment in crop insurance through a Responsible Innovation approach. The problem this study is trying to address is the ineffectiveness of remote sensing technology deployed in crop insurance in India and the issue of governance associated with its effective positioning. Issues of accountability, values, and sustainability assumed high significance in new and emerging technologies like UAV. A Responsible Innovation approach, with its various dimensions, can be used to study UAV technology, which is in nascent phase in Indian agriculture. The problem of ineffectiveness of remote sensing technology can be addressed with the

research question: how can the challenges of of UAV technology governance be addressed by a Responsible Innovation perspective? What is the risk-taking ability of UAV technology in comparison with other remote sensing technologies? The study is exploratory in the sense of the newness of the UAV technology in crop insurance in India. The study found that UAV technology has immense scope for application in Indian agriculture given the uncertainties in weather conditions triggered by external factors such as droughts, cyclones, and catastrophic events.

Informal Innovation And Actor Network Theory: A Case Of Value Added Products Of Rice, India *Wairokpam Premi Devi, Entrepreneurship Development Institute of India*

Harnessing the local resources has become a major constraint in Manipur, India, despite its abundant natural resources. It is necessary to innovate and upscale local products so that the state would have less dependent on other states. In order to response to the societal problems related to the dependency of food products from neighbouring states, few local industries from informal sector have flourished. Innovations in the informal sector are complex processes and need to understand in their context. Thus, the research work will aim to understand the role of STI policy specifically in the case of informal sector through the lens of Actor Network Theory (ANT) and how it can be instrumental for fulfilling the gap in the existing STI policy? Ethnography would be used to explore the socio-cultural and political context and role of key actors (both human and non-human). It is expect that the basic premises of ANT such as symmetry, the inclusion of non-human actors; will expand the knowledge of informal sector innovation process and provide new paradigm for the STI policy development. Thus, ANT Theory could be instrumental for the fulfilling the addressed gap of STI policy in the state of Manipur and it will help STI policy to give due attention to each and every actor network involved in the informal sector innovations in food processing industries. Key words: informal innovation, value added products of rice, actor network theory, STI policy,food processing industry, Manipur.

Session Organizer:
Andrew Ventimiglia, The University Of Queensland
Discussant:
Brad Sherman, University of Queensland

050. Caring across Borders: Materiality and Belonging in Transnational Families I
Papers for Open Panels/Caring across borders: Materiality and belonging in transnational families
Open Panel
11:00 to 12:30 pm
ICC: E5.9
Participants:

'He Doesn't Know it's Facebook: Exploring How Older Karen Migrants in Victoria Communicate Transnationally *Shane Worrell, La Trobe University*

This paper considers the ways in which older Karen humanitarian visa migrants living in regional Victoria, Australia identify – or do not identify – as social media users when using Facebook and other platforms for transnational familial communication. Drawing from qualitative interviews with Karen migrants aged over 50

and their younger relatives (conducted as part of the Baldassar and Wilding ARC Discovery Project, Ageing and New Media), this paper explores how interviewees' individual sense of a digital self might affect the frequency and quality of their interactions with family living in Southeast Asia. Miller and Madianou's concept of polymedia provides a framework in which to, first, explore various forms of social media use among the sample group and, second, consider to what extent – if at all – interviewees are aware it is social media, such as video calls via Facebook Messenger, they are using to communicate. If access to polymedia is an important component of transnational familial wellbeing, how does identifying – or not identifying – as a social media user affect the frequency and quality of online interactions among transnational families? In this context, how might not identifying as a social media user reinforce or deepen aversions to technology? To what extent might this increase older migrants' dependency on younger family members who are better engaged with social media? And where would this leave the bonds that these older migrants -- despite the challenges of transnational familyhood -- would like to see not only survive but flourish? .

Lives in the Aftermath of Genocide: Reimagining and Reimaging 'Ethnically Cleansed' Villages as 'Cyber Villages' *Hariz Halilovich, RMIT UNIVERSITY*

The 1992-95 Bosnian war created the largest refugee crisis in Europe since World War Two. Often, families were forced at gun-point to leave their homes and all their belongings behind. When they could, they took with them family albums, documents, manual coffee grinders, house keys and other small objects of sentimental value that could be hidden in the handbags or pockets. In many instances, their homes were not only looted and appropriated by others but also completely burned down. The objects the refugees managed to take and retain with them before fleeing became precious possessions and the only material reminders of the homes and lives they once had. Using the internet and social media, many of the refugee groups from Bosnia-now scattered across Europe, the USA and Australia-have been exchanging old photographs, documents, images of the personal objects and stories about their 'former' local places. In the process, they have able to reconstruct their local identities and memories by creating vibrant 'cyber villages' as an alternative to the places lost. Based on conventional and digital ethnography, this paper discusses the ways Bosnian refugees and migrants utilise material objects, stories, digital technologies and new media in order to recreate, synchronise and sustain their identities and memories in the aftermath of 'ethnic cleansing' and genocide and in the contexts of their new emplacements and home-making practices in diaspora.

Medicines from home to mitigate alienation abroad: Explaining Indian-Australians transnational health-seeking *Bianca Brijnath, National Ageing Research Institute; Josefine Antoniades, Research Fellow*

The Indian diaspora is the fastest growing immigrant group in Australia and one of the world's largest Diasporas. In this paper, I draw on ethnographic data from Melbourne, Australia (including 28 interviews and 5 focus groups) to explain how Indian migrants procurement of medicines from India is used to mitigate

alienation in Australia. Procuring medicines from India sidesteps limited access to subsidised public healthcare in Australia when visa conditions did not permit full-fledged access, overcomes costs associated with buying medicines in Australia, and ameliorates the risks of not obtaining preferred prescriptions in Australia. Procuring medicines from India was also configured by gender and age; Indian men frequently sought medicines to improve their individual bodies and functional capacity, whereas Indian women typically sought medicines to improve their capacity to care for their children. Indian children, who were not first-generation migrants, were not given medicines from 'home' but only Australian medicines to help localise them to Australia. Unlike in previous studies, participants neither described feelings of cultural familiarity with Indian health systems as reasons for procuring medicines from home, nor did they elaborate on the therapeutic value of being taken 'home' to recover. Rather, integral to both typologies were fragmented understandings of citizenship and belonging in Australia. This was most clearly evident in participant's difficulties with navigating an Australian healthcare system that was unfamiliar and incongruous with previous cultural experiences and expectations.

Mining mobile families: digital media, non-resident work and family relationships *Jolynna Sinanan, University of Sydney*

The role of digital media in overcoming the burdens of distance has received much interest in migration scholarship (Fortunati et al., 2012, Gretschke, 2012, Madianou and Miller 2012). Yet, despite the obvious role digital media plays for transnational families, its significance in mediating the impact of non-resident work on family relationships, gendered family roles, expectations and obligations is currently unknown (Baldassar, 2016; Meredith, Rush & Robinson, 2014; Taylor & Simmonds, 2009). This paper brings together these areas of inquiry to explore how mobility and absence are common features of family life (Baldassar and Merla, 2014). The paper draws on preliminary fieldwork conducted in the coal mining Bowen Basin region as part of a wider ethnographic study that interrogates the ways digital media impacts upon mobile labour and non-resident workers in the resource extraction industries comprised of FIFO (fly-in, fly-out) DIDO (drive-in, drive-out) and BIBO (bus-in, bus-out) workers in Queensland. The research combines conventional ethnography with non-resident workers in mining accommodation villages, on-site, and their families in source destinations. It also incorporates innovative methods including portable kit studies with workers to gauge routine material practices and the meanings attached to movement while the worker is away (Horst & Taylor, 2014; Ito et al. 2009). The paper contributes to the panel by critically discussing ideas of belonging through 'doing family' and creating a sense of 'family-hood' across time and distance through material and digital practices (Baldassar & Merla, 2014; Bryceson and Vuorela, 2002; Nedelcu & Wyss, 2016).

Picturing Care at a Distance: Image for Intergenerational Care in Indian Transnational Families *Tanja Ahlin, University of Amsterdam - AISSR*

How do different kinds images shape intergenerational care at a distance? In this presentation, I explore this question based on ethnographic fieldwork I conducted

with families of nurses who migrated from Kerala, South India, to Oman and other countries worldwide. Using material semiotics as method of analysis, I approach everyday information and communication technologies (ICTs) as members of the 'transnational care collective' (Ahlin 2017) that work together with nurses abroad and their elderly parents in India to enable care at a distance. I analyze how different types of ICTs afford different kinds of care, based on what they allow to show. Through a comparison of webcam, smartphone and phone I examine how live, static and mental images that these technologies produce influence care in various ways. As my fieldwork data show, these images are helpful for the nurses to provide 'telecare' to their parents, but also for the parents to provide emotional care and support to their adult children and grand-children abroad. However, images also complicate people's relations as they can be manipulated and even manipulative. Thus, people can use images to show certain things, but hide others, and they may prefer a certain type of image to others because of the particular emotional effects they produce. Reference 2017 Ahlin, Tanja. Only near is dear? Doing elderly care with everyday ICTs in Indian transnational families. Medical Anthropology Quarterly. DOI: 10.1111/maq.12404

Session Organizers:
Bianca Brijnath, National Ageing Research Institute
Loretta Baldassar, University of Western Australia
Maho Omori, National Ageing Research Institute

051. Asia-Pacific STS Network Business Meeting
Single Paper Submission
Lunchtime Workshop
12:30 to 2:00 pm
ICC: C2.4
The meeting will discuss the progress and organisation of the APSTSN and also provide an introductory point for APSTSN members to meet each other
Session Organizer:
Richard Hindmarsh, Griffith University
Chair:
Richard Hindmarsh, Griffith University

052. Indigenous STS Meet-Up
Single Paper Submission
Lunchtime Workshop
12:30 to 2:00 pm
ICC: C2.5
A meet-up for indigenous and non-indigenous scholars who work on the wide range of 'Indigenous STS' topics. This might include those who research indigenous knowledges, settler colonial spaces, indigenous peoples' perspectives on science and encounters with scientific institutions, how scientific research and STS alike might be 'indigenised' and much more. Come along and meet others in this emerging field.
Session Organizer:
Timothy Neale, Deakin University
Chair:
Timothy Neale, Deakin University

053. Tapuya Editorial Board Meeting
Single Paper Submission
Business Meeting
12:30 to 2:00 pm
ICC: C2.6

Session Organizer:
Leandro Rodriguez Medina, Universidad de las Americas Puebla

054. EASTS Editorial Meeting
Single Paper Submission
Business Meeting
12:30 to 2:00 pm
ICC: E5.6
Session Organizer:
Wen-Hua Kuo, National Yang-Ming University

055. Exploring Approaches to Catalyzing Transdisciplinary Engagement
Papers for Open Panels/Exploring Approaches to Catalyzing Transdisciplinary Engagement
Open Panel
2:00 to 3:30 pm
ICC: C2.1
Interdisciplinary approaches to scholarship and teaching traditionally combine experts from different academic disciplines to provide innovative responses to complex problems; transdisciplinary approaches, by contrast, extend expert combination out beyond the walls of the academy. Academic institutions are increasingly interested in transdisciplinary combinations that engage community partners and non-academics in longitudinal partnerships. This transdisciplinarity has assumed a variety of forms, such as participatory action research or citizen science, but missing in these forms is the participation of the arts and the humanities. This panel seeks international contributions that reflect on previous and current approaches to transforming infrastructure to support transdisciplinarity, especially those approaches that involve building communities. This panel is interested in exploring the following questions: What is the role of interdisciplinary units or programs in work that expands beyond the bounds of the academy? What critical infrastructure is necessary for transdisciplinary research? To what extent should local communities be involved in shaping and programming an academic institution's approach to transdisciplinarity? What are the best ways to involve local arts and maker communities in transdisciplinary efforts? How do we prepare students and postdocs for transdisciplinary careers outside of academia through engaged research and coursework? How do we transform the traditional institutional infrastructure around reappointment, promotion, and tenure in order to support transdisciplinary collaboration and education?
Participants:
Building Transdisciplinary Research Communities: Re-envisioning "Community" Engagement *Stephanie Vasko, Michigan State University*
Often when we consider the creation of new transdiscplinary academic initiatives to tackle complex problems, like centers or university-sponsored research programs, we consider our on-campus members as our first priority. With the growing popularity of citizen science and art/science collaborations, it's time to rethink the traditional approach. In this talk, I'll present the community-engagement strategies being used by the newly-formed Michigan State University Center for Interdisciplinarity, where we are considering community as an ever-expanding circle encompassing faculty, students/postdocs, and local community members and involving all levels in our strategic planning. For adding new perspectives to complex problems, we expand Ribes & Baker's 2007 "Modes of social science engagement in

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community infrastructure design" to modes of humanities engagement in trandisciplinary initiative and community infrastructure design. In integrating local community perspectives in an integrative, and not prescriptive manner, I'll explore the five topics of tension around public engagement posited by Delgado, Kjølberg, and Wickson (2011). I'll also consider the notions of experience and expertise put forth by Collins & Evans (2002) and contrast this with how local knowledge and expertise can greatly inform solutions to complex problems. I'll touch on the potential for students and postdocs interested transdisciplinary careers outside of academia to gain transferrable real-world experience in problem solving and opportunities for networking. Finally, when it comes to building/managing communities, I'll reflect on my experience as an American Association for the Advancement of Science Community Engagement Fellow and the need to address roles like these in the STS literature.

Commons Wealth: Integrative Design Catalyzing Community Solar from Uni, to Muni, to State *Jeffrey R. S. Brownson, Penn State University*

Solar power development in diverse communities is not slowed by a dearth of resource (sunshine), or impending breakthrough of technology (photovoltaics). The challenge is cultivating human capital, social capital, and rooting trust among stakeholders. Planning for coupled solar solutions to food-water-energy problems (e.g. solar ecology) is an STS challenge, amplified when solar projects engage a collection of participants without joint intention. We seek transdisciplinary, translational practices that align collectives of stakeholders toward formation of jointly intentional group agency and regenerative solutions. Community-led solar fits the framework of common pool resources (CPR): goods are challenging to exclude (sunshine), and goods are subtractable (electricity). However, CPR system creation can be hobbled by instinctive non-cooperative behavior (low communication, inability to sanction rule-breakers). Nobody wishes to be the "sucker" in the case of a failure of trust, particularly among diverse experts and non-experts. But non-cooperative strategies are grossly inefficient for managing CPRs. We present a practiced process to catalyze the on-boarding of diverse stakeholders for community solar CPRs. Approaching solar development with finite cooperative games, a series of interactive workshops, has demonstrated the potential to catalyze community solar (e.g. initiate larger projects in less time), optimize solar utility, and reduce risk among stakeholders. This repeated, facilitated process puts high value in stakeholder identity, merges expert with local voice, and embraces pride in place. The cooperative project approached a Pareto optimum for stakeholders pursuing solar options. The preferred outcome would not have been obtained (in a reasonable time frame) without the third-party facilitating the cooperative games.

The role of Open Value Networks in Catalyzing Transdisciplinarity *Ele Jansen, University of Technology Sydney; Jacqui McManus, Faculty of Transdisciplinary Innovation, University of Technology Sydney; Susanne Pratt, University of Technology, Sydney; Monique Potts, Faculty of Transdisciplinary Innovation, University of Technology Sydney; Katie Ross, Institute for Sustainable Futures, University of Technology Sydney*

Transdisciplinarity is a growing non-discipline that seeks to fundamentally re-vision the walls of the academy, but at times when facilitating this growth or change, the walls of the academy (procedures, norms, rules, paradigms) feel immovable and immutable. This paper presents the case study of an informal, experimental community that has grown within the walls of the academy but has spread to include members of the community. The underlying dynamic of the group, an Open Value Network, is to explore how the 'Feminine', Intuition, and other potential anathemas to the academy, but more traditionally accepted in the arts and humanities, can be embodied in the academic, transdisciplinary praxis. Open Value Networks, a relatively new concept with traditional roots in the Commons, and can loosely be described as a group of voluntary participants who seek to develop new processes and norms for shared value creation and social change. OVNs are largely non-monetary and emerged in their latest form within open source, P2P and creative commons communities online and offline. We explore how the intentionally emergent process of an Open Value Network has, and has not, functioned as 'critical infrastructure' for transdisciplinary praxis, for example as legitimizing new ways of being, becoming, and belonging in a transdisciplinary academic space.

Transdisciplinarity: From Policy to Practice? The Case of the Centre for Digital Life Norway *Maria Bårdsen Hesjedal, Institute for Interdisciplinary Studies of Culture. NTNU; Heidrun Åm, Norwegian University of Science and Technology*

In recent years, there has been an increased attention towards transdisciplinarity. This has different reasons. It is an instrumental request at times. But transdisciplinarity also emerges out of scientists' need to learn methods and theories from other fields—including experienced based knowledge through actors outside of academia—in order tackle problems that arose due to an increased specialization of scientific disciplines. Experience shows that practicing transdisciplinarity is not straightforward. In this paper, we explore whether funding a transdisciplinary research centre works as an approach to catalyse transdisciplinary engagements. Our case is the Centre for Digital Life Norway (DLN). Policy-makers wanted transdisciplinarity to be an important theme in this newly established national biotechnology centre in order to generate social value through biotechnology research. In addition, Responsible Research and Innovation (RRI) shall be an integral element of all DLN-activity, bringing together biotechnology and social science and humanities (SSH), as well as social inclusion beyond the wall of academia. Drawing on participant observation and semi-structured interviews, this paper studies how transdisciplinary collaboration plays out in selected DLN's research projects' practices: What are their strategies to achieve transdisciplinarity, and are there barriers that hinder it? We will in particular reflect on the role of SSH in this infrastructure and on how the DLN Research School trains students for transdisciplinary careers. The paper wishes to further develop STS' understanding of transdisciplinarity, and thus to contribute to a better understanding of the term.

Session Organizer:
  Stephanie Vasko, Michigan State University
Chair:

Stephanie Vasko, Michigan State University
Discussant:
　Michael O O'Rourke, Michigan State University

056. Unsettling STS 2
Papers for Open Panels/Unsettling STS: Scaling up critical
indigenous analytics
Open Panel
2:00 to 3:30 pm
ICC: C2.3
How do contemporary forms of indigenous life, scholarship, and
activism unsettle the political stakes and scholarly methods of
STS? Recognizing that the 4S meeting of 2018 will be held on the
historical and stolen lands of Australian indigenous peoples, this
series of panels will explore the possibilities, the productive
irritants, and inescapable problematics of thinking through the
social study of science, medicine and technology in settler colonial
societies. Settler colonialisms and technopolitics share long and
complicated histories, histories which have only recently begun to
receive critical attention within STS and related disciplines.
Technoscience has pervaded indigenous engagements with the
state, corporations, academics, and experts, generating paradoxical
tests of legitimacy and new sites of wealth extraction, underscoring
the entanglements between the nation, citizenship, knowledge
claims, and land. Attending to specific sites of engagement and
resistance demands new ways of doing (and undoing) STS
scholarship. We seek papers that complicate the articulation and
circulation of sociotechnical imaginaries; illuminate the ways
archival and biomedical technologies shape claims to identity and
belonging; and defy prevailing models whereby individual experts
enroll allies and cultivate power. We are particularly interested in
papers that speak to the legacy of colonial epistemologies in the
history and philosophy of science and medicine, new innovative
projects that work to decolonize medicine, science and technology
(and science and technology studies itself), and speculative visions
of an indigenous science studies. We also welcome submissions
that subvert the conventional conference paper format, whether
through video, audio, or literary productions or live performances.
Participants:
　Narrating climate change on northern terms: Arctic Journalisms,
　　Civic Spaces and Indigenous Publics *Candis Callison,
　　Unversity of British Columbia*
　　Mobilizing indigenous experiences with and narratives
　　about climate change through various media can and do
　　provide important insight for broad global publics of what
　　it means to live with climate change both in the
　　observable present and the predicted future. Representing
　　and reporting on diverse indigenous peoples however can
　　be extremely challenging given that media narratives tend
　　to reproduce stereotypes, ignore Indigenous people and
　　knowledge, and/or frame Indigenous people as proxies,
　　victims, or heroes. This is particularly problematic in the
　　Arctic, where Indigenous peoples, their non-human
　　relatives, lands and waters have often been used to
　　represent and demonstrate climate change as a stark and
　　global-scale crisis already underway even whilst historical
　　antecedents and chronic crises related to colonialism in
　　the region remain unexamined and excluded from
　　discussions about potential climate-related solutions. This
　　paper draws on ethnographic research with Indigenous
　　and non-Indigenous journalists across Canadian Arctic
　　and sub-Arctic territories as they navigate diverse
　　Indigenous publics, and changes to journalistic practice
　　related to digital media and civic space in an era of

climate change, global audiences, and settler-colonialism.
It argues that journalists are working at what Tallbear
(2014) calls "the intersections of multiple systems of
domination," where reporting has stakes and
consequences for configurations of power and social
relations. It also seeks to contribute to "understandings of
technosciences that account for colonial histories and
postcolonial conditions" (Subramaniam et al, 2017), and
asks how journalism might contribute to communal
resilience and what Whyte (2014) terms "collective
continuance."

Path Dependence: Wirelessness and (De)colonial Maneuver in
　'Post-War' Hawai'i *Tyler Morgenstern, UC Santa Barbara*
　Aiming to unsettle the common tendency to cast the
　network as a "privative construct…that subtracts the need
　to be conscious of the geography, physicality,
　temporality, and underlying history of the links between
　nodes," this paper provides an historical account of
　ALOHAnet, a packet-switched, wireless computer
　network developed at the University of Hawai'i, Mānoa
　beginning in 1968. Framing the network within a local
　history of colonial incursion and decolonial maneuver—
　one in which telecommunications infrastructures are
　deeply imbricated—I argue that ALOHAnet functioned as
　a technopolitical interface between the territorializing
　operations of US settler colonialism and the strategic
　exigencies of post-War US Pacific imperialism. This
　interface, however, was a noisy one, a scene of encounter
　where "colonizing systems" squarely met Indigenous
　commitments to land and sovereignty. Indeed, as the
　network's architects elaborated ALOHA into a set of
　protocols designed to link Hawai'i into a vast
　intercontinental and transoceanic internetworking
　architecture, a resurgent Hawaiian sovereignty movement
　rallied around the cry, "Aloha ʿĀina." Reappropriating
　'aloha' from the militouristic discursive economy in
　which it had become embedded during WWII, and
　welding it instead to an expressly Indigenous claim on
　land ('āina), Kanaka Maoli activists threw into relief the
　emphatically material stakes of ALOHAnet's ethereal
　architecture, contesting an imperializing technopolitics
　that sought to transform not only Hawaiian lands, but
　'Hawaiianness' as such, into strategic military assets. This
　paper enjoins STS scholars to interrogate the colonial
　entailments of ICTs, especially those wireless devices that
　continue to inspire vertiginous narratives of transcendence
　and deterritorialization.

Privatisation by Association – Natural Resources and Electricity
　Generation *Marama Muru Lanning, University of Auckland*
　Against the wishes of many Māori and non-Māori New
　Zealanders, the National government partially privatised
　New Zealand's electricity generating industry between
　2013 and 2014. Using the Māori concept of kaitiakitanga
　(guardianship) I will examine how contemporary
　privatisation processes redefine Māori identities and
　relationships with lands and natural resources (rivers,
　lakes, geothermal resources and wind) in their tribal
　territories. This study introduces the moral dilemmas and
　ethical contradictions that emerge for iwi-Māori in
　relation to neoliberal privatisation. My paper asks: how
　do flax-root Māori understand the sale of electricity
　companies that draw on local natural resources which are
　recognised as: tūpuna (ancestors), tupua (spirit beings)
　taonga (treasures), atua (super-natural beings) and

whānau (family); how do iwi-Māori describe their relationships with rohe (region) specific natural resources and electricity companies; how does iwi shareholdership in electricity generating companies influence Māori practices of environmental stewardship and how is the new Labour-led Government 'thinking and talking' about natural resources in New Zealand? My discussion will reveal the complex range of Māori experiences and responses to privatisation in Māori rohe and contributes to scholarship on the impacts of privatisation.

Salvage Minds: Representing and Intervening on Unceded Territories *Tom Ozden-Schilling, Johns Hopkins University*
The idiom of salvage continues to loom large in contemporary Indian Country, yet the othering echoes of the well-intentioned urge to "save" have long ceased to be solely a problem of scholarly representation. In this talk, I examine how the technical labor involved in representing change has embedded new concepts of salvage throughout unceded Indigenous territories in British Columbia, Canada. Since the late 20th century, the technocratic management of unceded lands has caused Indigenous and settler communities alike to measure the meaning of many everyday practices through the salvaging of landscapes, relationships, and senses of self. Often consigned to damaged landscapes through historical resettlement, many of the Indigenous governing groups who only recently began gathering technical resources and political clout have immediately faced difficult choices brought on by the cumulative effects of resource extraction and climate change. How would new developments be weighed against documentary practices designed to prove cultural distinctiveness before the law? What, exactly, would be saved, and for whom? How would young people recruited into tribal government jobs be asked to balance emergent professional demands with more intimate forms of obligation? Perhaps most crucially, who among the experts whose appropriations marked an earlier era of salvage could be trusted as future allies? As the prospect of regaining outright title to stolen lands is held aside for platforms of immediate engagement, this talk examines how new relationships between the representational artifacts and interventionist strategies of salvage are taking shape in the marginal spaces of Indigenous technocracy.

Unsettling Addiction Science in Vancouver's Unceded Territory *denielle a elliott, York University*
Vancouver's Downtown Eastside (DTES), an urban indigenized space on unceded territory, is the site of a dense assemblage of public health interventions for addictions and epidemiological research on drug abuse prevention and treatment. In this community, and others across Canada, Indigenous peoples are differentially subject to the disciplinary modes of biomedical and state regulation through discourses of addiction. Addiction science has been used in the Canadian context to deflect from the historical legacies of colonialism and structural violence that shapes urban spaces like the DTES and the lives of urban Indigenous peoples. This ethnographic paper reflects on how medico-scientific knowledge of addiction and neurology are used to govern urban Indigenous communities, masking the racialization of addiction science in Canada. It asks: In which ways is contemporary addiction science a revised form of colonial logic at play (constructing settlers as compassionate

saviours and Indigenous communities as dysfunctional and chaotic)? What would it mean to unsettle or decolonize addiction science in this space? If we acknowledge that the fields of STS and addiction science are both products of western thinking, white science, and if we consider the historical legacy of drugs and other substances in Canadian colonial law, how can we develop an approach that works to decentre western thinking on drug use in settler colonies? As a first step in unsettling addiction science and theory, this paper is anchored solely in Indigenous theory and narratives—scholarly, fictional, and non-fictional—as a means to displace settler epistemologies on addiction.

Why did they take him away? Following Aboriginal remains using modes of existence *Rob Garbutt, Southern Cross University*
In 1891 the Peabody Museum at Harvard University took Neddy Larkin, an Aboriginal man, into their skeleton collection. He was returned in 2012 to his original place of burial at North Lismore, NSW. Amongst the many questions his present-day community ask are: How does that happen, that a man would be stolen from his grave and bought by a museum on the other side of the world? And how does it happen that over a century later that same museum decided to send Neddy home without asking for their money back? This paper outlines an approach to answering the first of these questions using the method Bruno Latour sets out in An Inquiry into the Modes of Existence. By placing Neddy Larkin at the centre of the action rather than emphasising the agency of the non-Aboriginal actors, this approach enabled a diplomatic engagement between Aboriginal and non-Aboriginal researchers who undertook this project. Neddy's spiritual importance as ancestor and kin could be maintained, while the plural ontology of Latour's modes of existence sensitised the analysis to the many transformations between modes Neddy underwent during his very Western journey. Finally, the focus of modes of existence on the value that gives potential for action, enables an understanding of "why they took him away" that is fine-grained and avoids generalisations that jump immediately to colonialism and power, important as they are. Rather, by following Neddy Larkin closely we see in his progress colonialism and power under construction in concrete and locally meaningful ways

Session Organizers:
denielle a elliott, York University
Tom Ozden-Schilling, Johns Hopkins University
Chair:
Tom Ozden-Schilling, Johns Hopkins University
Discussant:
Kyle Whyte, Michigan State University

057. STS Africa: Infrastructures
Closed Panels
Traditional (Closed) Panel
2:00 to 3:30 pm
ICC: C2.4
This Panel seeks to explore the question "What are the boundaries of Science and Technology in Africa and how should we recognize and address both the uniqueness of African knowledge production and innovation on the one hand, and the potential that STS work in Africa has to offer to the field as a whole on the other?" We hope to answer these questions by working across the three domains of

information technology, medicine, and the environment as they relate to Africa. We seek submissions of abstracts in the following three areas: Information Technology – In contemporary Africa, the music of modernity is the ring of the mobile phone. An Information Technology revolution has swept the continent especially with the adoption of the mobile phone, and in later years, the mobile internet. Multiple African STS scholars have examined the mobile phone as a particular information technology that is co-constituted with Africa (de Bruijn, Nyamnjoh, and Brinkman 2009; Zegeye and Muponde 2012, Odumosu 2017). For example, de Bruji, Nyamnjoh, and Brinkman examine emergent innovations and new practices around mobile telephony such as healing practices (van Beek 2009), engineering design (Odumosu 2017) and mobile money platforms (Donovan 2012). Biomedicine – Similarly, much STS of Biomedicine in Africa has been in dialogue with Critical Global Health. Clinical trials have been a particularly important site for consideration of power and knowledge (Crane 2013, Kelly and Geissler 2012). In both the study of pharmaceuticals and the study of toxicology, Africa has also been part of the broader interrogation in STS of the tension in science between its claims to universality and its practice in particular places, because lab-based biosciences are figured as the most placeless and prestigious, and African scientists have challenged their exclusion (Okeke 2011, Pollock 2014, Tousignant 2013). There has been important work challenging the figuration of Africa as lack (Mkhwanazi 2016). Environment / Critical Studies of Infrastructure – The Environment is also central to how Africa is invoked. Africa is often used as a symbol of wildness on the one hand and underdevelopment on the other, and there is considerable scholarship of the intersections nature and development there (Walley 2004) that has much to offer STS more broadly. There has already been productive cross-talk between the spheres of Biomedicine and Environment. This is partly because of the way that, for colonial science, understanding the natural world in Africa was intertwined with other imperial projects including extracting natural resources of potential benefit to health (Tilley 2011). In the disparate spheres of bioprospecting and natural therapies on the one hand (Osseo-Asare 2014, Droney 2016, Foster 2017) and mosquito control on the other (Kelly and Biesel 2011), nature and medicine necessarily come together.

Participants:

An overview of the regulatory landscape for medical devices in Africa *Tania Douglas, University of Cape Town; Trust Saidi, University of Cape Town*

Although regulations for medical devices are important in promoting access to high quality, safe and effective medical devices, and in restricting the availability of products that put lives at risk, many African countries lack comprehensive regulatory frameworks. A review of ten African countries, namely Kenya, Nigeria, Egypt, Sudan, Morocco, Angola, Algeria, Tanzania, Ethiopia and South Africa, reveals that the existing regulations are fragmented and focus mainly on imports, as there are few local companies which manufacture products for the domestic and export markets. Controls are not yet well established to prevent the importation or use of sub-standard devices. This poses the risk of allowing sub-standard and poor quality medical devices to penetrate the market. None of the ten African countries reviewed have specific regulations or regulatory bodies dedicated to medical devices. Instead, the regulations pertaining to medical devices are presented within broader frameworks covering medicines, foodstuffs, cosmetics, and related substances. This is due to a lack of resources and of a

critical mass of skilled personnel to focus solely on the regulation of medical devices. This approach may overwhelm regulatory bodies, resulting in cumbersome and inefficient regulatory approval processes. Medical devices are adversely affected by regulatory delays as some have a short life cycle before they become obsolete. African countries could strengthen the regulation of medical devices at regional level by working towards harmonisation and convergence with the aim of sharing best practices between national regulatory systems.

Between the Lab and the Cooking Pot: Recovering Culinary Design and African Women's Creativity in Technological Studies of 'Climate-Smart' Seeds *Serena Stein, Princeton University*

As climate change begins to disrupt crop systems worldwide, scientists make urgent calls for agricultural adaptation to intensifying drought, floods and pest regimes. A large research community in the biosciences now focuses on improving seeds for climate change, with much of their emphasis on genetics. My paper considers the content and consequences of an unfolding 'climate-smart' paradigm for plant breeding in Africa, drawing from 22 months of ethnographic fieldwork in Mozambique among scientists and farmers. This paper brings needed attention to the ways that women employ social and technical knowledge to transform mutant plant species and modified seed varieties into appropriate, usable technologies through culinary innovation. There exists a widening gap between science and demand in plant breeding — particularly in Africa where new breeds are often rejected by farmers for not being practical to their way of life. Therefore, the basis of legitimacy of new seeds hinges on 'use,' and it is the work of women who invent usable forms of seeds to render plant technology vital. Nonetheless, global perception continues to reduce crop improvement to a particular knowledge domain (technical, grounded in a Eurocentric tradition, belonging to a select community of experts), while deepening highly uneven and unjust international flows of plant genetic resources among countries. By highlighting the creative production that takes place in the often dismissed, woman-centered realm of culinary practice, I expose how recent attempts to decolonize narratives of innovation in Africa remain overwhelmingly masculine (Mavhunga 2014) and are ripe for intersectional feminist political ecology interventions.

Folk tales of the Golden Goose: Lesotho Highlands Water Project and Lesotho's Ivory *Kefiloe Sello, University of Cape Town*

This paper seeks to chronicle the sociocultural and environmental narratives of Lesotho, tracing the deeds of Lesotho Highlands Water Project to the landscape, the people and the culture of this nation. It focuses on narrating stories of resettlement due to large dam constructions, loss of aquatic life, biodiversity and the picturesque vernacular landscape, eroded authorities and challenged cultures, all because of the need to make the landscape more global through commodifying it. This paper addresses the consequence of bureaucrats who run Lesotho and its rural landscape from red-carpeted boardrooms in urban settings. From the tick of their pens, a vernacular landscape was no more and indigenous knowledge overlooked, in its place is sprawls of walls of cement, steel bars and everything symbolic of

commodification and contemporary landscape all through the transnational movement of water. The story this paper re-counts is that of 'anti-civilization of environment for commercial benefit'. While the trickle-down effect that was spoken about due to water sales, is but a myth for those affected by the dam construction in Lesotho, many livelihoods have been distorted, cultural practices given up, indigenous knowledge snubbed and ecosystem of Lesotho overlooked; yet Anthropocene thrives dressed as development and technology advancement. Based on the research I undertook for my PhD study on Katse and Mohale Dams, this paper will highlight the mediatized success of LHWP at the expense of fictitious commodity water has become.

Geographical Advantage, Local Disadvantage? Astronomy in South Africa *Jarita Holbrook, University of the Western Cape*

South Africa is home to a growing astrophysics community. International multimillion dollar projects such as the Southern Africa Large Telescope and the Square Kilometre Array radio telescope (SKA), contributed to the existing astronomy community and allowed for its continued growth. The Astronomy Geographical Advantage Act (2007) established a section of the Karoo Desert as a 'preserve' for astronomy. This Act puts limitations on certain activities and technologies within the region, around the preservation of the dark skies and radio quiet region needed for astronomical observations. In 2014-15, I interviewed inhabitants in the region in the town of Carnarvon, the town closest to the core of the Square Kilometre Array. What emerged was a complicated picture of benefits, disadvantages, and disappointments associated with being 'the Home of the SKA'. A repeated benefit was that knowledge of Carnarvon was elevated within South Africa and the rest of the world because of the SKA. However, benefits beyond that were not so unanimous. Disappointments were connected to local infrastructure, workforce development, and commerce. I conclude that despite the clear language of the Astronomy Geographical Advantage Act, peoples' expectations were not in alignment with the reality of living near an astronomy observatory.

Sankofa Innovations *DK Osseo-Asare, The Pennsylvania State University*

Sankofa—one of the most well-known adinkra symbols of the Akan people in Ghana and Côte d'Ivoire—translates from the Twi language as "return and get it". This means that for a person, community or society to be successful in the future, they must draw on the past: Master existing ways of doing and learn from the wisdom of ancestors. Understood as an indigenous approach to innovation, Sankofa represents a paradigm for progress that integrates multiple ways of knowing—interpersonally and experientially—to induce personal and collective growth, in concert. The authors have proposed the term "Sankofa innovation" to describe a process emergent within the Agbogbloshie Makerspace Platform (AMP) project initiated since 2014 in the informal sector scrapyard and so-called "e-waste dump" located at Agbogbloshie in Accra, Ghana (Osseo-Asare and Abbas, 2016). Working with over 1500 young people—750+ grassroots makers from the informal sector and 750+ students and recent graduates in STEAM fields (Science, Technology, Engineering, Arts and Mathematics)—the

authors observed that while the former gained practical know-how heuristically via apprenticeship training, the latter learned technical knowledge through theoretical presentations, texts and examinations. Linking co-creation between the two sets of youth enabled synergistic outcomes, suggesting opportunity for bridging socioeconomic and cultural schisms widespread in African today by enabling environmental redevelopment rooted in local knowledge systems and capabilities. Parallel to "frugal innovation" in the global context, Sankofa innovation has much relevance to current discussion around knowledge commons, open-source, open innovation and sharing economy while recognizing potential bias toward African traditions of shared technology culture.

Session Organizers:
Toluwalogo Odumosu, University of Virginia
Anne Pollock, Georgia Tech
Discussant:
Natasha Vally, Centre for Humanities Research, University of Western Cape

058. How Does Mobility Change Researchers, Research Groups And Scientific Communities? (II)
Papers for Open Panels/How does mobility change researchers, research groups and scientific communities?
Open Panel
2:00 to 3:30 pm
ICC: C2.6
Participants:

Women belong in the home (country): examining gender differences in the scientific mobility *Cassidy Sugimoto, Indiana University Bloomington*

The last several decades have brought significant reforms aimed at improving gender parity in the sciences. These have been largely effective at increasing matriculation rates at all levels of education; however, women remain severely underrepresented in the scientific workforce. Women constitute a smaller proportion of papers and produce less individually. They are also cited significantly less than their male counterparts, even when publishing in journals of equal prestige. Several factors have been investigated to understand these disparities. The effect of mobility, however, has been largely neglected in these analyses. A global study of gender disparities found that women tend to collaborate more domestically than internationally when compared to men from the same country. One explanation could be patterns of inhibited mobility, which could also contribute to lower citation rates given that mobile scholars are more highly cited than non-mobile. In this study, we use Web of Science publication and citation data on all scholars (n=1,655,483) who published their first paper in 2008. We examine different rates of mobility between men and women, controlling for country and discipline. Production and citation rates are used as metrics of academic success to determine whether there are differential benefits of mobility for men and women. This study provides novel insight into the ways in which the scientific workforce is mobilized and the effects of this mobility, by gender.

Socio-cultural Contexts in International Research Collaboration *Roli Varma; Meghna Sabharwal*

This paper presents findings on international research collaboration from a National Science Foundation funded

study with 83 faculty in science and engineering (S&E) who returned to India after study and work in the United States. These faculty members were brought up in the Indian socio-cultural context, but they were professionalized in the scientific culture of Western academia. When they returned to India to take a faculty position, they knew collaborators in the United States with desired skills including their advisors. Yet, returned Indian migrant faculty face significant challenges in establishing successful international research collaboration with their American peers. Interestingly, this is not the case with collaborators from Europe and other parts of the world with whom they had little connection before moving to India. Findings show some inequities that exist between scientists and engineers in the United States and India that pertain to resources and attitudes towards collaboration.

A Study on Current Situation and Influence Factors of Transnational Migration of Scientific Researchers in China *Jianzhong Zhou, Institutes of Science and Development, Chinese Academy of Sciences*

In recent years, with the steady increase of economy and development of S&T in China, especially since the 2008 global financial crisis, on the one hand Chinese government has increased investment in S&T and infrastructure. On the other hand various talents programs have been launched to attract global high-level talents which results in the brain drain gradually transformed into brain gain in China. Generally, overseas high-level talents have played important roles in promoting the overall level and strength of Chinese science and technology, expanding international cooperation and exchanges, and enhancing Chinese scientific community's international status and influence. However, it is still worth analyzing and evaluating Chinese overseas high-level talents support programs for more efficient policy-making. In this work, we attempted to carry out a comparison study among three Chinese typical and significant overseas talent programs: "Hundreds of People Plan" launched by CAS, "Yangtze Scholars Program" launched by the Ministry of Education, and "Thousands of People Plan " launched by Organization Department of the CPC Central Committee. The overall analysis is carried out from two aspects: one is to explore the status and problems of winners of three projects (a total of 5098 samples) through a CV method based quantitative analysis, such as studying background, returning locations, research filed as well as their international organization positions. Further, a questionnaire based survey has been applied to researchers in universities, research institutes and companies. We are interested to find out their attitudes on the fairness and reasonableness of those talents programs, as well as the influence factors which may affect researchers' returning back to China. Based on this research, we proposed that the introduction of high-level overseas talents programs need top-level design and demand analysis, and a more relaxed policy environment is required to attract more foreign top scientists to work in China.

Short-term transnational mobility, gender and research careers in East Africa: The case of women in computer science *Ravtosh Bal, Concordia University, Montreal, Canada; Matthew Harsh, Cal Poly; G. Pascal Zachary, Arizona State University; Kerry Holden, Queen Mary, University of London; Jameson Wetmore, Arizona State University*

Transnational mobility of academics and researchers is an increasingly common global phenomenon, providing access to research positions and shaping the trajectory of research careers. Academic mobility is also a gendered process. Gendered roles, family ties, traditional values, national context and labor market conditions are some of the factors that determine access to opportunities as well as the decision to move. While long term mobility and migration leading to a "brain drain" is a serious concern for S&T systems in the Global South, short term transnational academic mobility in pursuance of a doctoral degree has been a key factor in developing computer science research capacity in East Africa. This process is mediated by donor agencies that provide funding for programs with the goal that participants return to their home country after earning their degrees to work as researchers. In this paper, we focus on women's career aspirations and experiences of pursuing doctoral degrees abroad to build their research careers. Our data is drawn from a long term ethnographical study of computer science researchers in East Africa. We examine how women experience this short-term transnational mobility and how it shapes their research careers. Our analysis considers both structural factors such as institutional environments, donor strategies, and university policies, and individual factors such as life events, family commitments, and career aspirations; as well as women's agency in managing their research careers. We find that donor mandates to provide women equal access to these opportunities have resulted in women being equally represented amongst the PhDs trained through many of these programs. While mobility has played an important role in building their research careers, women have had a mixed experience, shaped by traditional gender roles and expectations.

Academic Mobility, Transnational Capital and Career Advancement: Evidence from China's Changjiang Scholar Program? *li tang, Fudan University; Feng Li, Hohai University*

Academic mobility and associated transnational capital have long been championed as positive and worthy of supporting. Yet little attention has been paid to the catalyst role, if any, of transnational capital on researchers' career advancement. And if so, in which direction. Built upon the curriculum vitae of 1462 Chang Jiang Scholars, we examine the relationship between academic mobility and the speed of obtaining prestigious academic titles measured by post-PhD time lag and age when granted with national prestigious title. Our results suggest that the catalyst role of transnational capital on career advancement varies by the types of overseas experiences. Surprisingly, all else being equal, returnee scholars tend to obtain national academic title within a longer time period compared to the locals. This penalty of transnational academic mobility also holds for returnees with only overseas PhD training experience. Yet this liability can be turned into premium when combined with other types of overseas experience. In addition, the premium of working at alma maters suggests that strong intramural networks can accelerate scholars' career development.

Session Organizer:
Richard Woolley, Ingenio (CSIC-UPV) Universitat Politècnica

de València

Chair:

Richard Woolley, Ingenio (CSIC-UPV) Universitat Politècnica de València

Discussant:

Marie Sautier, University of Lausanne

059. Technomedicine and Reproduction

Single Paper Submission

Open Panel

2:00 to 3:30 pm

ICC: E3.2

Participants:

The technoscientization of IVF? Contemporary trends and counter-trends *Nicola J Marks, University of Wollongong*

With so-called 'three parent embryos', personalised drug regimens, genome editing and the use of 'next generation sequencing', global IVF (in vitro fertilization) is becoming more and more high-tech. In many ways it is a prime example of the 'biomedicalization' trends Adele Clarke and her colleagues have identified, whereby medicine is ever more imbricated in the new techno-political economy. However, as they suggest, there are also a number of counter-trends. Indeed some aspects of IVF are becoming more low-tech and removed from corporate medicine. This paper draws on data collected in interviews with IVF practitioners, in the media and in scientific reports, as well as on the existing literature on IVF, to explore these trends and counter-trends. It finds that different aspects of IVF illustrate and contradict different processes of biomedicalization, and highlights some of the complex and multi-dimensional ways technology and society interact, both within and across nations. It considers not only places such as the US and Europe, but also the Pacific and Asia. The paper offers an empirical contribution to STS by highlighting some of the ways in which IVF is done today, and a theoretical one by reflecting on the usefulness of the concept of 'biomedicalization' in bringing to prominence some of the contradictions of IVF practices.

The Egg Timer Test: Direct-to-Consumer Fertility Testing for Women in the Age of Elective Egg Freezing *Moira Kyweluk, Northwestern University*

Frequently branded the "Egg Timer Test," direct-to-consumer fertility screening using a number of reproductive hormones is a burgeoning medical service. Facilitated by internet-based biomedical companies and aided by the consolidation of large-scale diagnostic laboratories, this type of fertility screening represents a new entrée point into the medico-technological possibilities often promised by advances in reproductive medicine. Easier access to screening aligns with visions of revolutionizing healthcare via more information in the hands of individuals (Lupton 2013; 2016), shifting from biomedicine to "info medicine" (Brown and Webster 2004). As the human body is increasingly made accessible through data, Egg Timer Testing has become a new tool in this larger American project of reproductive biosensing (Mort and Smith 2009; Wilkinson, Roberts, and Mort 2012). Childless women who desire biological children and test hormone levels are given more biological information but less certainty about their actual ability to conceive. This paper presents data from an experimental ethnography project in which a group of

women were given access to fertility screening services by a major US-based company and followed throughout the process. Using semi-structured interviews and participant observation, their experiences around anticipated future (in)fertility are traced to understand how new biomedical information influences a woman's conception of self and understanding of her future. Ultimately, this paper asks, how do women respond to elective fertility testing and make meaning of the experience within their individual life course imaginaries—that is, the ways a woman projects her life proceeding from the current moment forward— in real time?

Is Non-Invasive Prenatal Testing The New 'Right Tool For The Job' In Human Genetics? *Zoe Olivia Jacoba Barker, University of Wollongong*

Over the last decade, the field of prenatal genetics has experienced significant technological innovations. New technologies, popularly called 'non-invasive prenatal testing' (NIPT), can detect foetal genetic information in ways markedly distinct from previous technologies. Now, by analysing a blood sample drawn from a pregnant woman, the entire genome of a foetus can be sequenced. Despite the 'cutting edge' status this technology has gained, it has received relatively little public or academic attention. This paper presents a snapshot of my PhD findings thus far. 14 health professionals working in prenatal care in Australia have been interviewed, centring on their attitudes and understandings of NIPT and foetal genome sequencing. Because formal and public discussions of NIPT have been dominated by the authoritative discourse of biomedicine, the aim was to provide interviewees with the opportunity to express personal and professional concerns about NIPT in a private and informal setting. Whilst the development of NIPT has been coined as 'a paradigm shift' and portrayed as a new, 'revolutionary' tool of empowerment for expecting women and parents, this paper finds that anonymous responses given by interviewees problematise the popular and far more stable understandings of NIPT that have taken dominated formal, public spaces. Drawing insight from Adele Clarke's work on 'the right tool for the job' I aim to highlight the contingent and heterogeneous nature of this emergent technology (and it's 'rightness'), as well as the important roles spatial situatedness and temporality have in shaping discursive accounts of emerging biotechnologies like NIPT.

Exploring the Role of Reproductive Technology and Gender Discrimination in India *shivmohan prajapati, central university of Gujarat*

The paper discusses that science and technology is in the momentum of change in every aspect. Society is also changing simultaneously with the technology but the gender relation having the stereotype notion and behaviour still perpetuating in the society with same bias in attitudes and attributes. The gender relations are rooted in the socio-cultural background in India. The paper specifically discusses reproductive technology related to the life of women in context of gender relation. What are the conflict, contradiction, and interaction between the changing dimension of reproductive technology and gender rigidness in India? The technological situation is changing in India in the context of gender but the role of technology in gender relation is difficult to categorise

having a neutral role. In patriarchal society of India cultural and economic significance of male child is preferred. Girl child has been neglected in every aspect. The case of female foeticide with help of sex detection technology is very rampant which has raised many questions on the use of this technology as it is considered boon and bane at the same time. In context of this, the paper attempts to explore the role of reproductive technology in promoting son preference. How society and cultural factors are reacting to the technology in general and female foeticide in particular. Furthermore, the paper also delves deeper into the issue of technology becoming the tool to control the women reproductive power according to the male needs and status. The arguments are based on secondary sources. The approach and theoretical framework of study is based on Social Construction of Technology (SCOT) perspective. Keywords: Social Construction of Technology (SCOT) Technology, Reproductive Technology, Gender relation, Patriarchal Society

Demographic Risks: Reproduction, Population Control, and the Techno-Medical Gaze in Contemporary India *Nayantara Sheoran Appleton, Victoria University of Wellington*

With each catastrophic climate related event, the conversation rightly turns to the dangers of climate change – for us all collectively in the global north and south. However, in some spaces, the dangers of climate change are often articulated as a problem of 'over population' and the pressures this places on the environment and societal structures. This focus on population, even within liberal quarters, is a slippery slope, as it creates the conditions under which the lives and bodies of poor brown (and black) peoples are surveilled under new techno-medical programmes. These bodies are rendered risky, again! In this presentation, drawing on field work in India, I show how global and local organizations, public discourse, and state policies coalesce around 'population control' measures under the guise of 'family planning' and women's 'empowerment;' all the while working to prioritize neo-Malthusian population control agendas. While draconian 'population control' policies never ceased in India, there was a marked reduction in reproductive rights abuses in the past few decades. However, with new technologies and medical interventions combined with public discourse on the risks of 'overpopulation,' there has been a subtle acceptance of population control measures. Looking at the science of demography and its utilization by differently positioned groups, I posit that draconian reproductive politics have found new allies in some local and global environmental movements and are making a resurgence in contemporary India.

Session Organizer:
Nicola J Marks, University of Wollongong
Chair:
Nicola J Marks, University of Wollongong

060. Collating Publics In Collections Of Human Biological Material And Data 2
Papers for Open Panels/Collating publics in collections of human biological material and data
Open Panel
2:00 to 3:30 pm
ICC: E3.3

The panel seeks to explore how particular 'publics' – of citizens, stakeholders, populations, or otherwise – are put together through collections of human biological materials and data. Contributions study how publics are co-produced in technoscientific, social and political orders that shape the formation of repositories containing human biological materials and data (as applied in e.g. the medical, forensic, migration policy context). Papers address, but are not limited to, the following questions: how database systems and their classifications configure ontological entities with particular normative ascriptions of publics; how practices of taking samples, producing, storing and exchanging materials and data, and governing databases enact, affect or mobilize notions of citizenship; how political issues produced by and reflected in such databases are negotiated and thereby (re)make affected publics and forms of (biological) citizenship; how the materiality of database infrastructures and networks that make databases work enable or constrain imaginaries of collectives; how such databases give rise to ecologies of participation that mobilize engagement. In this panel contributions present empirically rich and conceptually informed reflections on the relations between the collection of human biological materials and data, and the formation of diverse publics and forms of citizenship, across different cultural locations, contexts of application and forms of storage. With the contributions to this panel, we thereby explore the empirical, theoretical and political significance of how human collectives are imagined in practices of collecting. In this second session papers focus more on how publics are made together with particular research objects.

Participants:

Neuroscience of race and the production of biological citizens *Torsten Heinemann, RWTH Aachen University*

Increasingly, neuroscientists are investigating how the brain processes and perceives racial difference, and the specific neural mechanism that underpin racial behavior and attitudes using novel imaging technologies. In an attempt to eschew the historical associations between the brain (and mind) sciences and scientific racism, these researchers stress that neurobiological studies of race do not reinforce a biological inscription of race, but instead capture how our brains process the socially constructed nature of race. In this paper, we investigate the biopolitical significance, challenges, and hopes imbued through the neuroscience of race. We are especially interested in the way race is defined and operationalized in neurobiological research that focuses on the neural correlates of race recognition and categorization, i.e. how we realize race via the brain. Moreover, we will provide a first of its kind analysis of the relationships between the neuroscience of race and the much more studied genomics of race. How does the neuroscience of race differ, substantiate, or challenge the taxonomic claims and material consequences made through the genetics of race? We contend that neuroscientific appraisals of race may be equally problematic as genetic understandings, and maybe even more challenging to discern, given their perceived biosocial standpoint that seemingly helps immunize the science against standard critiques of scientific racism and biological determinism. Overall, this paper evaluates the neuroscience of race as a sociotechnical imaginary. Researchers have imagined the findings from this science will be used to mend future racial relations. We assess the possibilities and consequences of this sociotechnical imaginary to help create a new kind of democratic subject—a (neuro)biological citizens, in which

individuals will be ask to use neurobiological understandings to overcome and reshape their misperceptions about race.

Connective tissues: making intergenerational publics in a regional placenta biobank *Maria Fannin, University of Bristol; Julie Kent, University of the West of England*

In the early 1990s, pregnant women were recruited to a longitudinal study of child health in the south west of the UK. The study collected lifestyle data and biological materials from women during pregnancy and at birth, including whole placentas. The placenta biobank has been maintained for over 25 years and contains over 8,000 specimens. This paper considers how links between biological materials and bio-information are central to the generation of new forms of biovalue. Drawing on interviews with mothers enrolled in the study and with scientists and curators involved in the creation and maintenance of the placenta biobank, we consider how the placenta is valued as a 'connective tissue' that links mothers and children as a study population across generations. Despite the relatively few research studies that have made use of placentas in the biobank, the value of the placenta collection is expected to increase as materials and data from future generations are collected. We suggest that the placenta biobank constitutes a multi-generational public, recreating the original cohort of mothers and children. As a co-created tissue, the placenta is also viewed as a potent symbol of the research study's aim to collect data and materials from the child's first 'environment,' that of the mother.

Involving citizens in the data bank: a case study of the China Marrow Donor Program *xiaojie li, Peking University*

In order for the data bank to be a valuable reservoir of genetic information, large numbers of participants need to be recruited. Participation in data bank is apparently driven by altruism and the public concern about the confidentiality of their samples. The China Marrow Donor Program(CMDP) is a non-profit organization and has enlisted 2.31 million potential HSC donors so far and enjoyed good reputation among citizens. This study explored how CMDP manage to recruit donors and how they built the trust among the participants. According to the investigation of the CMDP, we find that Voluntary Service contribute a lot to its operation. The volunteers are ordinary citizens and played an important role in many aspects of registry operation like public advocating, donor selecting, donor caring ,product transportation, and data inputting. As the deliberative informed citizens, the volunteers played an important role to establish contact between the CMDP and the donors. The CMDP held the voluntary services workshop and awarded thousands of "Five Star Volunteer" annually. The volunteers designed the voluntary services brochure to enhance the public understanding of CMDP. This study further demonstrate the ability of informed deliberative publics to provide input to institutional practice and governance of data banks. The management of CMDP represents a China characteristics but provide a effective way of enhancing the trustworthiness of databank governance internationally.   Key Words: volunteers,CMDP,trustworthiness

Exploring a Global Imaginary of Biobanking *Edwina Light, Sydney Health Ethics, University of Sydney; Lisa Dive, Sydney Health Ethics; Miriam Wiersma, Sydney Health Ethics; Ian Kerridge, Sydney Health Ethics; Wendy Lipworth, Sydney Health Ethics, University of Sydney*

The networking of biobanks of human biological materials and data is driven by multiple factors, including scientific necessity for building large or rare collections, and operational and governance purposes. Biobanks may choose to network regionally, nationally or internationally. The act of doing so influences the production of biobanking publics and imaginaries, as well as what such concepts might mean in this context. Presenting findings from a national study of biobanks and global networking, we will explore stakeholder practices and views on: * how Australian biobanks collect, store and exchange human biological materials and data * the nature and purpose of these biobank collections, including those defined by organ/tissue, disease/condition, or population, and from whom materials and data are gathered * whether, why and how Australian biobanks network across global borders * the ethical and legal frameworks that are formed by these biobanks to support the local and global flows of human biological materials and data, knowledge, finances and infrastructure. The empirical work of this research project includes surveys of Australian biobankers, donors and members of the general public, as well as interviews with these stakeholders. Theories of globalisation inform our analysis. This picture of global biobanking practices and perspectives of Australian stakeholders will allow us to explore notions of a global imaginary of biobanking, including the issues of significance to stakeholders engaged with this evolving activity.

Session Organizer:
Torsten Heinemann, RWTH Aachen University
Chair:
Nina Amelung, University of Minho
Discussant:
Erik Aarden, University of Vienna

061. Without Borders? The Future of Global Health and Transnational Humanitarianism
Papers for Open Panels/Without borders? The future of global health and transnational humanitarianism
Open Panel
2:00 to 3:30 pm
ICC: E3.4

Global health is a cheerful term. It conjures images of a healthy planet and people, speedy cross-border collaboration and medical innovation: a vision of pan-human wellness. But underlying global health are the spectres of global risk and global illness; jet-speed pandemics; networked dependencies and cascading crisis: the pathogenicity of globalisation. Just as global health captures the imagination, so transnational humanitarianism occupies a central place in contemporary rhetoric and governance. Humanitarian action has become a de facto model for global crisis response. The problematisation of "the future" as one of planetary crisis has been met with anticipatory action. Where Homo sapiens is a scientific category, "the human" and "humanity" are social and political designations, subject to re-negotiation. Attempts to redefine the human—and potential tiers of humanity—are visible in phenomena as diverse as the resurgence of ethno-nationalism, the response to the global migrant and refugee crisis, new genetic technologies, and in posthumanist and transhumanist discourse. This panel questions the Anthropocenic futures of global health and transnational humanitarianism: how emerging science,

technology and morality might play out in entangled health and humanitarian crises. Coordinating a diverse array of scholars and themes, the panel seeks to enliven and extend STS discourse on technology, ethics, ecology and health, particularly in the global South. How will evolving health and humanitarian technologies respond to, and anticipate planet-wide social, ecological and political upheaval? What are the performative effects of rendering the future omnipresent? And, in the age of transhumanity, will there be a trans-humanitarianism?

Participants:

Anticipating Catastrophe: Health Systems Strengthening Refashioned as Innovative Pandemic Preparedness *Marlee Tichenor, University of Edinburgh*

In the wake of the West African Ebola Virus Epidemic, a diverse array of global health funders has invested in health systems strengthening and cross-border, collaborative development projects in both case-present and case-absent West African countries. One illustrative example of this new investment is the series of Regional Disease Surveillance Systems Enhancement (REDISSE) projects, the first of which was approved by the World Bank in June 2016. The recipients of this first International Development Agency loan were Sierra Leone, Senegal, Guinea, and the West African Health Organization. REDISSE is a long-term umbrella project with the goal of including all 15 Economic Community of West African States (ECOWAS) and extending well beyond the spectre of Ebola. Senegal, which effectively managed and treated the one case of Ebola within its borders during the epidemic, was chosen for the first round of funding because of the country "has shown regional leadership in developing effective disease detection and research capacity." Within the context of this project and a hoped-for "Emerging Senegal," how are imagined scientific futures configured by anticipated health catastrophes? How are health systems, a flexible term, refashioned as protectors from a disastrous future and visions of promoted human well-being de-prioritized? As a plan for cross-border scientific solidarity and care, how is REDISSE designed to take on this work?

Microbial Menaces: Calculating, Imagining, And Performing Potential Pandemic Futures *Meike Wolf, Goethe University Frankfurt*

This paper deals with technoscientific visions of a potential or not-yet future: that of an influenza pandemic. Pandemics are represented as a threat not only to health, but to economic and political wellbeing on a global scale. Pandemic fears are currently drawn into the sociotechnical domains of resilience planning, surveillance systems, and into globalised expert networks. Within these rationales, a state of risk is made the rule rather than the exception. Countries like the UK or Germany have adopted the need to prepare for future outbreak events by designing preparedness planning systems. Following Ben Anderson's (2010) attempt to systematise the logics of anticipatory action, the paper will analyse pandemic preparedness as a global health practice. In order to understand how the not-yet future of an influenza pandemic is made present and tangible, the paper first discusses how pandemic futures are calculated through specific spatio-temporal relationships. Second, the paper critically scrutinizes the construction of potential outbreak scenarios underlying pandemic preparedness and its impact on transnational

humanitarianism. Third, it looks at the performance of a not-yet future through local emergency exercises. It will be argued that pandemic preparedness bridges spatial, technological and administrative gaps between globally circulating viruses and local areas of intervention, thereby enacting potential futures as a matter of local concern. The paper is based upon ethnographic fieldwork among health professionals, resilience planners, and local authorities in London and Frankfurt; it combines a critical global health perspective with STS-informed insights into the socio-material contingencies of future-related expertise.

Towards Planetary Health: From Pandemic Epicenters to Global Environmental Risk Models *Lyle Fearnley, Singapore University of Technology and Design*

This paper examines a contemporary scientific displacement in anticipatory research on emerging infectious diseases: one that displaces the search for the geographic points of viral emergence, or what I have elsewhere called 'pandemic epicenters', with the construction of planetary-scale models of environmental risk. Until recently, emerging disease preparedness programs and research projects largely involved 'virus hunting' in humans and animals, as popularized by the work of Nathan Wolfe, for example. Today, however, pandemic preparedness research is moving from the surveillance of 'viral traffic', towards the modeling of the ecological bridges and highways along which this viral traffic moves; and from the molecular study of viruses in the biosafe laboratory toward the mathematical and visual simulation of landscape features, species interactions, and economic developments. Intersecting with calls for planetary health and the Anthropocene, these models-- once rooted in regional or national scales--today often highlight the risks of human-driven environmental change at a global scale, such as growth of livestock populations or expansion of plantation agriculture. In the process, modelers are refiguring humanity as a planetary actor whose future health is threatened by its own actions. Focusing on the micropractices through which models are built and their modes of visual representation, this paper analyzes the historical and technical foundations of this reflexive humanitarian configuration of global health.

Topologies of Humanitarian Attention. Recruiting Patients Accross Borders for Reconstructive Surgery in Amman *Evan Fisher, CSI, Mines-ParisTech*

I will address one form the Nature/Culture divide (Latour, 2008) takes in the critique and practice of transnational humanitarianism. For critics, humanitarianism exists in a regime of exception in which bodies – reduced to bare life – and territory – sovereignty has become mobile – are dispossessed (Agamben, 1998; Fassin, 2010; Pandolfi, 2003). For humanitarians, these are matters of practical urgency: how to care for the suffering bodies of distant people? Material is ethnographic and archival – from a Médecins Sans Frontières hospital in Amman, Jordan and Paris headquarters – and concerns patient selection procedures. I will first describe the reflexive organization (Callon, Rabeharisoa, 1998) of a recruitment network that spans the borders of a war-torn Middle East to find patients in need of reconstructive surgery. I will show how MSF inscribed a practical duality (James, 1912) in the apparatus: "medical" against "humanitarian". These

categories partially coincide with the bios/zoê divide (qualified/bare life), and drive reflection on what serves ethical patient selection. Our understanding of these categories is heightened if we take them as existing in different topologies – network and fluid (De Laet, Mol, 2000) – helping MSF to occupy space in different ways. Secondly, I will explore how this practical duality affected recruitment practice – medical consultations and a deliberative committee – and how the duality was reformulated, allowing MSF to avoid some kinds of discrimination, while remaining attentive to the immediate and future needs of bodies and persons under reconstruction. I will contribute to the study of global health by describing the ordering (Law, 1993) of attention (Hennion, Teil, 2002) necessary to the care to distant fragile beings (Tronto, 1993; Mol, 2008).

Cartographic Citizenship: An Ethnography of Humanitarian Mapping *Darryl Stellmach*

With her ethnography of Chernobyl survivors anthropologist Adriana Petryna established the notion of "biological citizenship". Petryna documented how, despite suffering a range of chronic effects of radiation exposure, state support for survivors was only forthcoming through an onerous course of medical verification. The process of achieving rights and recognition through medical certification Petryna termed "biological citizenship". Drawing on ethnographic fieldwork among humanitarian aid workers during the South Sudan civil war, I argue that a parallel process can be seen at play in crowdsourced humanitarian mapping in war and disaster zones—a process I tentatively call "cartographic citizenship". In a similar way to which biological citizenship helped individuals to assert themselves in the face of state abandonment, humanitarian maps establish the inconvenient fact of one's existence. People's demonstrable, cartographic, presence in a crisis zone speaks to their biological and social needs. Humanitarian and disaster mapping assert a claim: of a needful citizenship, individuals that should be accorded rights. Viewed from this perspective, cartographic citizenship can be seen as consistent with the prevailing discourse of aid and health care innovation as an emancipatory public good. However, as the ethnography reveals, these technologies play out along, and tend to reenforce, existing power relations. It is only through the mediation of benign experts and technological infrastructure that individuals are able to make claims to cartographic citizenship. Inclusion on a map is a form of surveillance, and the goods accessed in return are the bare minimum required for survival. This paper is a critical, empirical examination of this nascent technology, and hopes to inform its future deployment.

Session Organizers:
Darryl Stellmach
Marlee Tichenor, University of Edinburgh

062. 'Smart' Patients and Self-care

Papers for Open Panels/Critical Digital Health Studies
Open Panel
2:00 to 3:30 pm
ICC: E3.5
Participants:

Minor creations of technological tactics for everyday life with a chronic disease *Claudia Maria Bagge-Petersen, Department of Public Health, University of Copenhagen*

Through participatory on- and offline ethnographic research the project wishes to investigate everyday life for minors with a chronic disease as it is formed and negotiated through relations between family, friends, school, games, smartphones, healthcare professionals, treatment etc. What are the experiences, practices, challenges and tactics for minors with chronic diseases and how do they themselves involve technologies for management? What are the prospects for involving knowledge about home grown tactics for disease management in design processes of eHealth solutions for minors? The paper's main argument is that eHealth solutions aim at producing treatment related data in certain epistemological and practical ways in an everyday life setting that is already inhabited by translations of knowledge, tactical practices of treatment and self-initiated collaborations with technologies. Within STS the contribution lies in voicing children and adolescents and their performances and agency in overlapping spherical spaces of disease, treatment and on- and offline realities of everyday life.

Online Expert Mediators: A New Stakeholder Problematizing The Role Of Blogs In Patient Engagement *claudia egher, Department of Technology and Society Studies, Faculty of Arts and Social Sciences, Maastricht Univer*

Digital technologies have often been hailed as conducive to patient engagement. Using Collins and Evans' concept of interactional expertise, this paper examines the online activities of three bloggers diagnosed with bipolar disorder. It argues that by combining medical knowledge with their lived experiences, and by utilizing the affordances of blogs, they have become a new type of stakeholder, the online expert mediator. The bloggers were selected using the Google index as relevance indicator, and thematic analysis was performed on the data collected, including hyperlinks and images. Collins and Evans' concept is extended by considering the role of the medium through which interactional expertise is displayed and by showing that its bi-directional character is more substantial than they had envisaged. The findings indicate that through the knowledge they display and the alliances they forge, these bloggers have successfully positioned themselves within a landscape characterized by increased individual involvement in health and have expanded their influence beyond that of most authors of illness blogs. The rise of this new stakeholder category denotes a possible turn from community activism to exceptional entrepreneurial selves. Despite views that the Internet would have broad democratizing effects, the high standing of online expert mediators is not the result of a rebellious use of this medium, but of dynamic alliances with 'traditional' experts and of a strong media presence. This paper thus provides a nuanced perspective on the level of authority and agency that people diagnosed can acquire through digital technologies. Keywords: patient engagement; interactional expertise; illness blogs

Becoming an informed patient? Digital health use among Australian women with chronic health conditions *Sarah Maslen, University of Canberra*

Based on interviews and focus groups, this paper examines how Australian women with chronic health issues are accessing and co-producing digital health information and its implications for practitioner-patient

relationships. Websites and social media platforms are used to fill gaps remaining from the practitioner-patient interaction, to self-diagnose and even to contest practitioner claims to expertise. Some women use apps and wearables for self-tracking to better understand their condition, separate to practitioner consultations. This raises important questions about the affordances and limitations of digital health for information and self-management. Traditionally, health and illness have been assessed through embodied means with practitioners. Digital health transfers degrees of this embodied, interpretive work to patients themselves. Building on sociomaterialist perspectives, I explore the ways in which users incorporate digital media into their health sensemaking and negotiate the practitioner-patient consultation in light of their digital health use. While most women expressed confidence in their digital health information literacy, bodies and data are not self-evident and users need to interpret what they consider to be a symptom and decide whether information is valid or appropriate. There is a risk here that digital health is seen as complete information, but diagnosis rests on complex, embodied sensemaking difficult to replicate in digital environments. This suggests a need to find dialogic ways for patients to provide information to practitioners, and for practitioners to understand how digital health influences patients' presenting concerns.

Worn Out: How mental health wearables devices are changing the landscape of mental health *Antoinette Pavithra Joseph, Macquarie University*

My paper is based on an ethnographic research project that seeks to understand how the contemporary western understanding of mental well-being and ill health is forged through the use of technological interventions such as wearable devices. I attempt to untangle the complex interactions between researchers, device creators, devices, multi-national corporations, service providers and device users who inhabit a posthuman cyborg world where our devices serve as prostheses for supposedly dysfunctional minds. I draw from a range of theorists, from Paul-Michel Foucault and Donna Haraway to Andy Clark and Deborah Lupton, and build upon existing scholarship around the quantified-self movement, to examine how my interlocutors ascribed meaning to the physiological artefacts of emotion captured by wearable devices, in order to construct a sense of self and normativity based on their interaction with these devices. Further, I also explore how device manufacturers arrive at algorithms that determine hitherto elusive objective baselines for affective states. Is the seeming reductionism of a range of meanings of the physiological signs of distress read by devices a cause for concern? Especially when interpreted by employers and individuals themselves, removed from the context within which an individual experienced these emotions? What role do policy regulations play in the process of interpreting physiological data (and the privacy of this data) such as heart rhythms and breathing patterns as related to mood states? Does the use of these devices prove therapeutic or are they being used as another means of socialization?

Understanding Digital Health in Smart Singapore *Gayathri Haridas, Singapore University of Technology & Design; Samuel Chng, Singapore University of Technology & Design*

The phenomenon of digital health and enabled ageing is a key strategic priority of Singapore's Smart Nation initiatives, launched in 2014. There are two diverging theoretical discussions about smart cities: Manuel Castell's critique on how power gets concentrated in specific actors/institutions and William Mitchell's optimistic view of a digitally liberated humankind. With an empirical study on two digital health services provided by the Singapore government, I aim to situate this discussion at the intersection of digital health and smart nation in Singapore. I explore the promises of digital health in Singapore and the lived experiences of citizens who use it with two cases. The HealthHub app provides the public with online access to all personal health information and hospital records with public healthcare institutions and National Steps Challenge encourages the participants through free wearable trackers to improve health by walking. Using interviews and observations, this study traces how Singaporeans make sense of, and negotiate with, the notion of 'smart digital health' as produced by the state. A rhetoric of 'empowerment' and 'engagement' is employed in the implementation of these projects with explicit goals of shifting responsibility of health away from the state to individuals, largely ignoring new social interactions and identity formations such technologies can create and its consequences. By looking at Singapore's smart nation policies from the bottom-up, this study aims to uncover unique and embedded insights on individual adoption of digital health and its implications for health care delivery and policy design.

Session Organizer:
Deborah Lupton, University of Canberra
Chair:
Deborah Lupton, University of Canberra

063. Science and Technology Studies and Science Education: 'High' vs. 'Low' Church Tensions (A)
Papers for Open Panels/Science and Technology Studies and Science Education: 'High' vs. 'Low' Church Tensions
Open Panel
2:00 to 3:30 pm
ICC: E3.6

Scholars and others have long encouraged infusion of research from science and technology studies (STS) into school science. Since at least the mid 19th century, for instance, educators like Spencer (1861) have recommended that science knowledge be learned through science inquiry activities informed by references to history, philosophy and sociology of science. Nevertheless, science education systems have tended to emphasize instruction in widely-accepted knowledge claims of the sciences and, associated with that, idealized conceptions of these fields. Struggles with authenticity of representation in science education (e.g. of phenomena, the social world, and ontological and epistemic groundings) seem to mirror STS publications (Breyman et al. 2017) – which have noted tensions between so-called 'High Church' and 'Low Church' STS (Fuller, 1993), the former emphasizing academic studies to represent the nature of science and technology while the latter prioritizing studies reforming these fields in ways benefiting societies and environments. Such tensions seem evident in, for example, nature-of-science education approaches – along with many 'STEM' (Science, Technology, Engineering & Mathematics) education initiatives – that avoid problems associated with capitalist influences on scientists and engineers and socioscientific issues education that prioritize students' reasoned personal choices about controversies over actions they might take to engage global crises (locally and

globally). 'Low church' approaches might also be said to value minoritized, rhizomatic flights away from staunch universalist, dominating understandings of science and phenomena. Papers in this Panel will, accordingly, address 'High-Low Church' tensions from a diversity of perspectives as they pertain to STS infusion in science education.

Participants:

Educating for disturbance as a 'natural' part of survival   *Jesse Thomas Bazzul, University of Regina*

Transdisciplinary studies that entangle the sciences, feminisms, Indigenous ways of thinking, the arts and various geographies are increasingly informing our approach to dealing with ecological crisis and collapse. One of the effects of these new forms of entanglement is that no thing is out of play for the fields of environmental studies. Work that has the potential to make desire visible in multiple ways, as well as outline the material politics between human and more than human bodies, can arguably play a major role in developing new ways of collective being (both a different ethics and politics). Building from Karen Barad's (2007) concept that 'nature' is always already queer, as being and difference is always co-emergent, intra-active, and 'cut' agentially, I discuss the notion of 'disturbance' as part of a queer ontology for environmental revival and survival. Using Anna Tsing's (2017) ethnographic work as a beginning point, I develop the notion of disturbance as a (queer) ontological force through a series of vignette examples that highlight how disturbance is a crucial part of entanglements. Disturbances are not something to be eradicated or valourized. Rather, calling attention to how disturbances functions can help teach communities how to survive and even thrive in what Anna Tsing terms the ruins of capitalism, or what Donna Haraway (2017) terms the chthulucene.

Remembering Ursula Le Guin (1929-2018): A secular saint of 'No Church' STS? *Noel Gough, La Trobe University*

In the year of Le Guin's passing, it seems timely to acknowledge and celebrate the unique contributions to public understanding of science and technology she made through SF (science fiction/ fantasy/fabulation). Haraway (2016, p. 5) refers to Le Guin as one of her 'partners in science studies, anthropology, and storytelling' (others include Latour and Stengers). Both Haraway and Le Guin have been my partners in exploring science education's imbrications with popular media cultures for many years (see Gough, 1993). If forced into a choice between 'High' and 'Low' Church positions in STS, I would choose the "minoritized, rhizomatic flights away from staunch universalist, dominating understandings of science and phenomena" of the 'Low Church'. But lines of flight (or deterritorialisation) enable movements away from spaces regulated by dominant systems of signification and I thus prefer to avoid binaries and imagine that the material-semiotic spaces of science and speculation that Le Guin explored (and to which she contributed) constitute a 'No Church' position in STS. SF and material worlds are now so entwined that they cannot be understood in isolation. In twenty-first-century technoculture, the objects of scientific inquiry are thoroughly colonised by subjects that once belonged entirely to fiction. This paper will present examples drawn from Le Guin's fiction and non-fiction writings to demonstrate that speculative fictions and material phenomena do not stand in a relationship of

externality to each other and that her work should be understood as constituting a distinctive contribution to the infusion of STS in science education.

Slaying monsters in/through STS, science, and education *Sara Tolbert, University of Arizona*

In the wake of climate change, increasing environmental disasters, the anti-science Trumpocene, and other longstanding environmental injustice issues, science educators and scientists alike are called on to take on more vocal activist stances and pursuits in the name of justice (Liboiron, 2017; Tolbert & Bazzul, 2017). Truly, "we need a new era of monster slayers" (LaDuke, 2016). Indigenous, anti-capitalist, anti-colonial, feminist, and environmental activists alike are igniting mass movements to disrupt market fundamentalisms and economic/environmental policies that kill, advocating instead for policies "embedded in interdependence rather than hyperindividualism, reciprocity rather than dominance, and cooperation rather than hierarchy" (Klein, 2014). Longtime American Indian and environmental activist Winona LaDuke (2016) writes, "I would like to see an elegant society, not a city of decay, and sorrow" (p. 298, 2016). Activism is an intra-action with science and the sociopolitical, as we strive toward a more "elegant" presentfuture. In this paper and presentation, I describe examples from scholarly and pedagogical efforts to reveal lines of flight and fugitive spaces through youth/teacher participatory action research in science and education. I reflect on how activist approaches to STS, science, and education can "exploit the few remaining 'cracks'" (p. 227) within increasingly neoliberal university contexts toward the critical transformation of a world-in-common (Russell, 2015).

The 'No' church of science education: Encouraging ignorance *Annette Gough, RMIT University*

In this paper I will argue that the current version of the Australian Curriculum being implemented in schools is more about encouraging ignorance and creating a 'No' church. A rejection of the 'high' and 'low' church binary provides an opportunity to de-centre arguments and engage with the silences in the curriculum documents that have been highlighted by others and more. Noel Gough (2013, p.1223), for example, noted the lack of mention of complexity as a key scientific concept in the Australian Curriculum, and that "the word 'complex' in relation to 'systems' […] appears only once". Annette Gough (2015) drew attention to the parallels between the silences around sociopolitical issues in government policies and curriculum related to STEM and those found with respect to environmental education two decades ago, and relates these to the resurgence of a scientific rationalist approach to curriculum. Elsewhere (Gough 2017a, 2017b) she discussed the silences around sustainability and marine topics in the Australian Curriculum. Cartoonist Judy Horacek (2016) highlighted the ignorance in society around science topics such as climate change, perhaps best summed up in her cartoon on Trying to explain science. I argue that the congregation of the 'No' church are the students who are rejecting science studies because they can see no connection to their lives in the science education they are receiving as it is not engaging sociocientific issues in a meaningful way that would enable them to participate in the political decision-making necessary for addressing environmental issues such as

climate change.

Session Organizer:

John Bencze, Ontario Institute for Studies in Education, University of Toronto

064. Neurosocieties: Interdisciplinary Explorations of the Brain, Culture and Ethics 3

Papers for Open Panels/Neurosocieties: Interdisciplinary Explorations of the Brain, Culture and Ethics

Open Panel

2:00 to 3:30 pm

ICC: E3.8

In the last two decades the neurosciences have become a highly prestigious and influential force in contemporary societies. The significant symbolic and financial resources invested within neuroscience research (e.g. the EU's Human Brain Project, and the US' BRAIN Initiative) as well as its translation into practice and policy raise a number of pressing issues for social scientists, bioethicists and STS theorists in particular. Thus, the Neurosocieties interdisciplinary open panel will address themes such as: the influence of brain-based explanations of personhood, health and behaviour in contemporary communities; how these explanations align and conflict with other ways of making sense of personhood; new social forms emerging in response to the rising prestige of neurosciences; and the responsible management of the expectations of patients, families and carers regarding promising neuro-interventions. Additionally, recent developments within the neurosciences – particularly the emerging interest in culture and social context – have created new opportunities for productive engagement between neuroscience, social science and ethics. Accordingly, the interdisciplinary panel will call for papers from STS, anthropology, philosophy, bioethics and related disciplines that explore new options for conceptualising: the relationship between brain, body and environment; the relationship between thinking, feeling, mood and cognition; understandings of agency and moral responsibility; and interdisciplinary perspectives more generally, on the brain, personhood and culture. The panel will prepare the ground for an interdisciplinary special issue on Neurosocieties.

Participants:

Environmentalizing the city: Urban Life and the Biophilic Brain *Des Fitzgerald, Cardiff University*

What does it mean to imagine a city as a particular kind of psychological and neurobiological environment? What happens when we re-think the politics of the city through ecological and environmental tropes – tropes that figure urban citizens as the bearers of a very specific neuropsychological inheritance, torqued by the psychogenic exposures that compose city life. In this paper, I address these questions by reporting from the early stages of a project on environmentalizing the city. This wider project focuses on how a range of actors, across a diverse set of sites in policy, research, commerce, and design, are coming to understand the problems of city life as the problems of a particular organisms, with particular brains, in particular environments. The paper reports from one part of this landscape –its relationship to an emergent language and practice of 'biophilia.' Rooted in EO Wilson's idea that human being have an innate affinity to be surrounded by other living things, biophilic design and planning practices are involved in a project of environmentalizing the city by situating 'nature' as the cure for the multiple ills of city living. Drawing on early stage empirical work, and rooted in recent work in the

environmental humanities, urban theory, and feminist STS, the paper asks: what might it mean to reposition the 'right to the city' as a kind of biophilic desire? What happens – neurobiological and politically – when 'nature' becomes the key site of intervention for the stressed brain of the urban citizen?

What Brain Scans Can and Cannot See Seen from a Thai Bio-artscape *Birgit Ruth Buergi*

Framing personhood in what are taken to be neurobiological terms has been criticized by science, technology and society scholars who see it as reductive to explain the interplay between genes, society, culture, and the environment with biochemical analyses of synaptic processes in the brain. Instead of resisting these tensions, this paper engages prospectively with visual images in which the neurobiological self, or synaptic self, takes center stage. This field-based intervention is a continued engagement with a global trend, theorized in my anthropological inquiry into the social lifeworlds of Southeast Asia's growing bioeconomy and creative industries as the "art-in-science-city phenomenon." Four stations along the "brain-art trail" connecting downtown Bangkok with Thailand's first biopolis Pathumthani Science City are both subject and research platform of this ethnographic incursion into a Thai bio-artscape. The visual narrative of selected artworks exhibited at contemporary art galleries and material objects displayed at science and medical museums dotting this trail creates dialogue between scientific and artistically-engaged explorations of the nexus between the physical brain and the subjective mind. A closer examination of these exhibits, presented as neurobiologically and neuropsychologically-informed art or "brain art" in this descriptive analysis draws into the discussion topics reverberating in current discourses of neuroanthropology, neurolaw and neuroethics.

Influence of Brain-based Explanations in the Subjective Experience of Anxiety and Depression *Andrea Clara Bielli, Universidad de la República; María Pilar Bacci, Universidad de la República; Gabriela Lilián Bruno, Universidad de la República; Lauren Pedrebon, Universidad de la República*

This presentation analyzes the influence of brain-based explanations of anxiety and depression in the subjective experience of mental illness of benzodiazepines and antidepressants users in Uruguay, a small Latin American country where these psychopharmaceuticals have become easily available to the population. Drawing on a combination of document studies, focus groups and in-depth interviews with 73 benzodiazepine and antidepressants users we explore the link between the notions of mental suffering, mental illness and personhood associated with use of these medications. The narratives of benzodiazepines and antidepressants users show that these notions have become a field in dispute between psychological explanations of the functioning of the self and neurochemical explanations of the functioning of the brain. In the users' narratives both kinds of explanations coexist, and this makes them resort to a set of biological, neurochemical and psychological metaphors to make sense of how these medicines work on their moods and anxiety symptoms. The narratives also show that the conflict between psychological explanations and neurochemical explanations calls into question the

very nature of the mental illness and the nature of the user´s self, insofar as resorting to psychopharmacological therapies and complying with the treatment presupposes a moral judgment about the strength or weakness of the subject.

Selective Neurologisation: Examining The Relationship Between Addiction Treatment Providers' Use Of Neuroscience And Client Subjectivity *Anthony Barnett, Monash University; Martyn Pickersgill, University of Edinburgh; Adrian Carter, Monash University*

Addiction neuroscience hopes to uncover the neural basis of addiction and deliver a wide range of novel neuro-interventions to improve the efficacy of addiction treatment. The translation of addiction neuroscience to practice has, however, been widely viewed as a 'bench to bedside' failure. Our qualitative study of addiction treatment providers' accounts uncovers how neuroscience is already at work in the addiction clinic and elucidates how 'neurologic subjects' are constituted in contemporary practice. We draw upon interviews with 20 Australian treatment providers, ranging from addiction psychiatrists in clinics to case-workers in therapeutic communities (many of whom were themselves 'in recovery'), in order to examine how treatment providers partially and sometimes reflexively utilise neuroscience to articulate client subjectivity (in a process we call 'selective neurologisation'). Our findings provide insights into how neuroscientific concepts are embedded within wider belief systems and explanatory models underlying addiction, how treatment providers account for the limits of neuroscience for their work, and how the deployment of neuroscience in practice is contingent on varying structural and contextual factors within local ecologies of care. Finally, we reflect on the implications of treatment providers' selective deployment of neuroscience for treatment, the scientific translation of addiction research, and future policy development both in Australia and internationally.

Session Organizer:
John Grant Gardner, Monash University, Australia
Chairs:
John Grant Gardner, Monash University, Australia
Cynthia Forlini, University of Sydney

065. National Identities and Transnational Science and Technology during the 20th Century: New Challenges
Papers for Open Panels/National Identities and Nationalism in Transnational Science and Technology during the 20th century
Open Panel
2:00 to 3:30 pm
ICC: E3.9
Participants:

Rethinking the public inquiry on science, technology and environmental change in new governance transitions *Richard Hindmarsh, Griffith University*

The public inquiry is a distinct and crucial part of policy-making in liberal democracies. However, its adequacy in Australia (as elsewhere) as an authoritative and effective 'advisory mechanism' on the promising benefits but sometimes controversial (socio-)environmental impacts of 'big' science and technology developments is a growing public policy problem. The intended impact of the reported project is to rethink the capacity of the public inquiry to better address the complex, multifaceted issues of controversial technoscience through policy interventions embedded in new governance transitions slowly developing worldwide. New governance in this study relates to principles of good governance and environmental sustainability. The presentation will summarise (i) the project's rationale; (ii) the methods of media, inquiry submission, and interview analyses, and policy learning; and (iii) the findings drawing on studies of Australian nuclear power and waste, GMO, wind farm, and coal seam gas inquiries; and a brief discussion on the substance and implications of the results. The study is driven by a constructivist STS and environmental politics theoretical and analytical approach. It aims to better understand and rethink the relationship among science, technology and society by way of the public inquiry conduit. Here, in relation to the socio-political and increasingly the environmental, as the concept of the 'public inquiry subset on science, technology and environment' (i.e. the 'STE inquiry') developed for this project highlights. To date, little examination of this area is apparent, internationally, despite its importance in contributing to national technological change agendas and the public and environmental interest.

Transnational science and technology in the development of the Chilean doctoral identities *Cecilia Ibarra, Universidad de Chile*

Transnational mobility of doctoral graduates and doctoral students played a foundational role in the creation of doctoral degrees in science and technology in Chile in the late 1960s, and, it has continued to be a distinctive feature of the Chilean doctoral system. However, research on the topic is scarce. The aim of the study is to gain insights into how doctoral and postdoctoral transnational mobility has contributed to the development of identities of doctoral students and of the national academic system. The research looked at the history of Chilean higher education and at the career trajectories of twenty doctoral graduates involved in doctoral education at different times. Initially, transnational mobility enabled the creation of the first doctoral programmes and later has become more multi-faceted in terms of types of mobility and effects in the field. Once the local system expanded its numbers of programmes and students in the late 1990s, transnational mobility became a path for inclusion in international research spaces and a factor of differentiation in the national higher education system. All along, the transnational feature of the doctoral degree has shaped the identities of doctoral graduates and of the national academic system.

Coercion, Consent and Contestation in Scientific Practices in India *Sambit Mallick, Indian Institute of Technology Guwahati*

The advent of the customer-funder-policymaker as a prominent element in scientific practice since mid-1990s in India and intensifying thereafter seems to have forced scientists to (re)negotiate scientific boundaries and to do some of the delicate boundary work. The challenge for scientists is to bring science "close enough" to politics and policy demonstrating social accountability, legitimacy and relevance, but to avoid either science or politics overextending into the other's territory – a prospect that is evidently disorienting and poses serious threats to idealized identities of science and the scientific community. Against this backdrop, the main objective of

the study is to examine the factors responsible for the shift in the practice of science from being a curiosity-driven activity to contract obligations. Through the radical changes in science funding and policy-orientation in India since mid-1990s, scientists seem to be vigorously mapping out the cultural spaces for science and for their own identities as forming the scientific community. In this context, scientists included in the study are not actually in the process of (re)classifying a satisfactory version of "science" and "policy" through their work. Instead, they are engaged in multiple versions actively negotiated science – policy boundaries, many of which seem to have different qualities and make different demands on them as researchers/scientists.

Public Reason and the Governance of Scientific Controversies *Yuan Haijun, School of Philosophy, Inner Mongolia University*

In the literature of Science and Technology Studies, we can find two models of public reason. One concerns the democratization of science, focusing on the public guidance of scientific agenda, like Anderson and Kitcher. The other concerns the basic role of science in qualifying the democracy, taking expertise as a key epistemic source for democracy, like Collins and Evans. This paper will argue, these two models of public reason could be taken as academic efforts to response two main challenges of collective decision-making: rationality challenge and knowledge challenge(as Goldman has noted). Furthermore, according to List and his collaborators, judgement aggregation theory can analysis these two challenges in a single formal model. In the light of the judgement aggregation theory, two models of public reason in STS could be integrated into one model of judgement aggregation, some limits of them also highlighted.

Session Organizer:
Barbara Silva, Universidad Catolica de Chile
Chair:
Barbara Silva, Universidad Catolica de Chile
Discussant:
William San Martin, Massachusetts Institute of Technology (MIT)

066. Making and Doing Prize Committee meeting
Single Paper Submission
Special Event
2:00 to 3:30 pm
ICC: E5.1
Private event - by invitation only
Session Organizers:
Michaela Spencer, Charles Darwin University
Teun Zuiderent-Jerak, Department of Thematic Studies - Technology and Social Change, Linköping University

067. Artificial Intelligence and Cognition as Social Praxis
Papers for Open Panels/Artificial Intelligence and Cognition as Social Praxis
Open Panel
2:00 to 3:30 pm
ICC: E5.10
Participants:

Artificial Intelligence and Algorithmic Sensitivity: The Case for Technology Ethics *Pawan Singh, Deakin University; Nandini Seth, Indian Institute of Management, Bangalore*

In the age of big data, Machine Learning (ML) and Artificial Intelligence (AI) algorithms have ensured improved targeted marketing, cost effective advertising strategies and efficient business decisions. While consumers have benefitted from these technological innovations, the data driven predictability of such algorithms has inherited various human biases and raised ethical and moral questions about algorithmic cognition. In this paper, we address these questions by examining scenarios in which predictive algorithms demonstrate human biases in social and economic life, possibly leading to real harm. Drawing upon technology design theories in ML and AI, Media Studies/STS, we posit that AI predictive algorithmic cognition can better learn human bias by acquiring the human trait of sensitivity. As a design principle that will enable technologies to potentially show a deeper understanding of social situations of individuals, we conceptualize sensitivity as a counter to the marketing strategy of identifying price (in)sensitive consumer behaviour. Using discourse/media analysis of cases like the Target teen pregnancy incident, which led to the privacy invasion of a pregnant teen on the basis of her purchase history, we suggest that the algorithmic design can discriminate positively to demonstrate sensitivity to confidential aspects of consumer identity derived from personal data. We suggest the use of implicit memory and associations to be built into the word embedding models for better detection of biases. The paper brings together concepts in ML design and theories of technology ethics, privacy and social identity in media and technology studies to connect diverse disciplinary expertise within STS.

Computerized Knowledge Creation: Machine Learning Models as Social Actors *Stephen Paff, University of Memphis*

Machine learning is a computer-based means of knowledge creation, generating insights beyond the scope of their creation. Machine learning models interact with human users in social encounters: humans inputting information, tweaking features, and the model advising actions. How do machine learning algorithms function as a means and object of communication between institutions and individuals? Following Bruno Latour's actor-network theory and Deleuze's concept of 'mutual becoming', I explore the transformation of machine learning models into social actors, facilitating interactions between policy-makers, software developers, and implementers. Further, this paper connects interdisciplinary perspectives to understand computerized knowledge production and non-human creativity, and discusses the moral implications of transparency and accountability to subjects in these processes. Finally, I reflect on how to ethnographically listen to the voice of the machine learning algorithm and its formative role in the formation of cultures.

Governing (with) algorithms: trust, uncertainty and the promise of transparency *Pedro Pablo Seguel, University of Texas at Austin; Rodrigo Gonzalez, Independent*

In the risk regime, there is an international trend to use automated systems to support administrative and technical decision-making processes with the promise of achieving more efficiency and objectivity. However, a growing literature has described a number of algorithmic harms deriving from information and secretive decision-making scenarios or black-boxes. STS studies have focused on

understanding algorithms' harms, opacities, and regulations. Yet, the way how political actors have discussed regulations for these technologies seems unexplored. How has transparency been practiced by governmental actors? How has the control or access to information been promoted? Our argument is that transparency is in a tension between uncertainty and public trust, where the institutional openness performs the citizen agency, making the transparency a legitimate political practice. We present a two-part critical analysis of the NY City Council Bill No. 1696 that proposes to regulate and demand information from city agencies that use algorithms to deliver public services. Based on Burrell's (2016) framework of opacity, we compare the content of the bill with European Union's prior regulation. Second, using the Committee on Technology's last discussion meeting recording, we present its favorable arguments and interested parties reactions and concerns. Finally, three main reflections are presented about (1) trust and transparency in the risk society, (2) the need and complexity of studying the regulation of algorithms in practice and with real political stakeholders, and (3) the effects of the NY case on cities adopting smart planning trends and how IT creates uncertainty about government autonomy and citizen agency.

Human Trust and the Machine: Transnational Online Business in China *e oreglia*

How do people and machines collaborate to create technical systems augmented by humans, that are able to overcome the limits of both? Starting from Lave & Wenger's observation that "understanding the technology of practice is more than learning to use tools; it is a way to connect with the history of the practice and to participate more directly in its cultural life" (Lave & Wenger, 1991:101), this paper analyzes the role of humans on AI-powered e-commerce platforms in China – Chinese systems that target Chinese consumers. Its goal is to understand why platforms that can provide a seamless online experience without any human friction point do in fact need humans to function, and how the role of humans is connected with the specific historical and social conditions of China. Specifically, humans are necessary to create an element of trust in both the products sold and the platforms used, as recent years have seen, in China, a complete break-down of trust on public and private institutions and among people. If "abstract representations are meaningless unless they can be made specific to the situation at hand" (Lave & Wenger, 1991: 33), what are we to learn from the social practices that make technological platforms usable? Does the "history and technology of practice" imply that, indeed, AI-powered platforms developed in China will be different from those developed in India, as AI is, in fact, a representation of socio-cultural practices, rather than simply a rational and abstract set of rules?

Of Hackers and Yearners: Constructionist Learning's Debt to AI and Cybernetics *Morgan G. Ames, CSTMS, UC Berkeley*

The learning theory "constructionism," pioneered by late MIT professor Seymour Papert, has enjoyed some fifty years of popularity in the technology world despite evidence that its most unique and provocative claims do not work. The computer-enabled learning that constructionism promotes shares with situated learning a deep distrust of the institution of school and focuses on providing tools that inspire children to joyfully teach themselves foundational concepts in mathematics and computer science. It diverges, however, in method: constructionism focuses on computers and software like the Logo programming language (or, more recently, Scratch) as the tools of inspiration, and tends to neglect the contextual factors that preoccupy situated learning scholars. Through an analysis of primary and secondary sources, this paper shows that constructionism's preoccupation with computer-based learning instead comes from MIT's artificial intelligence labs of the 1970s and the 'hacker' community they fostered. This work traces this history and explores the reasons behind the continued popularity of both constructionism and the ethos of this community, linking both to the cybernetic worldview that humans are, as AI pioneer and MIT professor Marvin Minsky liked to put it, "meat machines," and that "thinking like a machine" is a powerfully liberating experience. This utopian worldview has had an enduring influence on the technology world more broadly, allowing constructionism to ride along on its coattails. In deconstructing constructionist learning, this paper provides a framework for understanding the ideological histories of other inexplicably tenacious technology projects – and for contextualizing contemporary promises made about artificial intelligence.

To Bot or Not to Bot, that's the question *Sachit Rao, International Institute of Information Technology - Bangalore; Bidisha Chaudhuri, International Institute of Information Technology Bangalore; Janaki Srinivasan, International Institute of Information Technology - Bangalore*

While the need to factor in context is frequently flagged in AI research today, the challenge is in operationalising what we mean by "context" and whether/how it can be built into AI agents designed for variegated action. We propose a framework that starts with the premise that human activity and interaction is always situated in a broader social and cultural context, and builds on work that conceptualizes cognition as a situated and embodied activity that "occurs in very particular (and often very complex) environments" (Anderson 2003, 91). Our framework distinguishes between "learning to do" -- learning how to perform specific tasks – and "learning to be" -- how to be the person who undertakes these tasks (Lave 1988; Lave and Wenger 1991; Wenger 1999). For instance, there is a difference between learning how to stitch cloth and learning how to be a well-regarded tailor, but both help a person in their subsequent trajectory (Lave 2011). We question whether current models of learning in AI work well for achieving both these types of learning. If they do not, what kinds of interactions can we expect AI agents to handle successfully and which ones should be left to humans? We use the example of designing a chatbot for the administration of academic admissions to show how employing our framework can help us decide what chatbots can and can't do. Our paper will contribute to ongoing conversations in the STS community around the nature, potential and limits of machine learning and AI in present times.

Session Organizers:

Bidisha Chaudhuri, International Institute of Information Technology Bangalore

Janaki Srinivasan, International Institute of Information

Technology - Bangalore
Sachit Rao, International Institute of Information Technology - Bangalore

068. How Do STS Studies Translate Numbers: Knowledge, Theory, Method
Papers for Open Panels/How do STS Studies Translate Numbers
Open Panel
2:00 to 3:30 pm
ICC: E5.2
Participants:

Analyzing the Analyst: Cognitive Neuroscience, Experimental Performances, and a Return to Reflexivity *Yelena Gluzman, UCSD*

On the question of "How do STS Analyses Translate the Doing of Scientific Knowledge," the literature on STS methods of the late 1990s and early 2000s was clear: the doing of STS had to be radically rethought in order to foreground symmetrical and reflexive attention to the conditions of production and performative effects of their own research methods (Law and Singleton , Mol 2002, Law 2004). While STS methods have indeed proliferated in the decades following (as attested to by the popular Making & Doing session at 4S), fewer have pursued the practical question of how STS scholars might center their own practices alongside those of the communities and phenomena they study. This paper addresses this question through doing (and considering through doing) a reflexive, experimental STS research paradigm. Though this project does not explicitly deal with numbers, it pursues the issue of qualification and quantification in both its methodological design and its central question, one shared by myself and the cognitive neuroscientist with whom I was collaborating: how can a continuous, dynamic phenomenon like human interaction be rendered computational while keeping sight of situated meaning-making as it emerges? Taking seriously a ludic proposition, we videotaped ourselves as we attempted to analyze videos of spontaneous interactions. Subsequently, I transcribed and re-staged our acts of analysis with theater actors, looking at the resources we drew upon to re-member the interactions to be performed. In presenting our findings, I argue that coding and systemization do not exist apart from the embodied performances that shape and re-animate them, and that these efforts both to quantify and qualitatively interpret are in the service of making elusive phenomena available and actionable.

Bodies, Numbers and Politics: The Rise and Fall of the 'Quantified Self' Movement *Ana Viseu, Universidade Europeia*

With the motto, "self-knowledge through numbers," the Quantified Self (QS) movement seemed to be fast on the heels of other (neo)liberal technoscientific projects that posit the individual as the site of action, and numbers and quantification as the means for achieving Objectivity and Truth in the service of productivity, and efficiency. This depiction is not wrong. Created in 2007 by two influential technolibertarians from Wired magazine, the 'Quantified Self' (QS) movement encourages the use of technology to track, monitor and generate bodily data. Numbers present the key to a previously unknown reality allowing members to scientifically perfect themselves and their lives. The QS movement's enormous growth is testified not only in its increasing membership but also in the

mounting number of companies investing in this area. Yet, I argue, an analysis of the Quantified Self movement betrays a more nuanced and complicated view of the political commitments that quantifying practices of its self-declared members. Drawing upon ethnographic data and interviews with members of London's 'Quantified Self' group—the largest in Europe— I trace the early discourses that drove and justified the growth of the QS movement, and show how the movement's cohesiveness and identity scattered as the practices and technologies underlying it went mainstream. I show how QS was, to some degree a victim of its own success: as it went mainstream the practices and subjects through with, and from which, numbers were produced changed and became distinct entities. This, in turn, transformed the ethos and identity of the QS subject. This paper contributes to our understanding of the politics of numbers and numerical production and their entanglements with technoscientific movements.

How does STS (ac)count? Methods and critical engagements with quantification. *Oscar Javier Maldonado Castaneda, Universidad del Rosario*

STS has an strong tradition in the analysis of the production of numbers and the role of quantification in the governing of the different nature-culture that we dwell. However, numbers and quantification have been almost exclusively matters of critique. Its role as tools, methods and strategies of critique has been relatively marginal. This paper wants to open a dialogue about the role of quantification and the production of numbers within STS research practices. I present two alternative pathways to explore methodological engagements with numbers: Statactivism (Bruno, Didier and Vitale, 2014) and the hacking (Maxigas, 2017) of statistical and numerical devices. To illustrate the first path I discuss the development of alternative data infrastructures for the register of Human Rights violations in Colombia and the role of the production of numbers and statistics in contesting the official accounts of the war and its victims. As example of the second path, I present my own work on Markov Chain modelling in the estimation of the cost-effectiveness of HPV vaccination in Colombia. I have explored alternative uses of this device showing the contradictions in the claims of safety and effectiveness of the vaccine and presenting alternative enactments of the relations between populations, vaccination and risk.

Time and numbers: Counting the consequences *Barbara Bok, Swinburne University of Technology*

Every moment of every day, since the mid-1980s, STS scholars and members of societies rely on a coordinated dissemination of standard time signals realised according to an international uniform reference time framework. Vast numbers of timers embedded in devices and material and social practices are synchronised and vast numbers of data points are stored according to the values emanating from this global time network. Many scholars have critically examined assumptions and political implications undergirding this contemporary time framework. Despite its ubiquity, the assumptions are commonly unacknowledged and taken for granted. Few studies have examined contemporary time according to heterogeneous networks of actors and numbers - the approach that inspires this paper. According to this approach, the connection between time and counting becomes visible.

Time and counting have been closely linked ever since the first timing procedures involving water bowls, sundials, celestial bodies and pendulums. With this paper I review examples of STS studies, highlighting dichotomies and contradictions arising from the unexamined practices and discourses of time and numbers and their mediating effects. I identify for example, dichotomies such as singularity and multiplicity, control and surprise, unfolding and co-creating and supersedure and emergence and contradictions such as a single universal monotonic frequency versus the kaleidoscopic frequencies constituting life. My analysis has implications for how STS scholars are participating in reinforcing ways of engaging with the future that discount multiplicity, diversity, heterogeneity, emergence and other characteristics they often claim to value.

Manufacturing an Artificial Intelligence Revolution: Neoliberalism and the 'new' big data *Yarden Katz, Harvard University*

While the term "Artificial Intelligence" (AI) was coined in the 1950s, in recent years AI has become a focus of attention in mainstream media. Yet the forces behind AI's revival have been unclear. I argue here that the "AI" label has been rebranded to promote a contested vision of world governance through big data. Major tech companies have played a key role in the rebranding, partly by hiring academics that work on big data (which has been effectively relabeled "AI") and helping to create the sense that super-human AI is imminent. However, I argue that the latest AI systems are premised on an old behaviorist view of intelligence that's far from encompassing human thought. In practice, the confusion around AI's capacities serves as a pretext for imposing more metrics upon human endeavors and advancing traditional neoliberal policies. The revived AI, like its predecessors, seeks intelligence with a "view from nowhere" (disregarding race, gender and class)---which can also be used to mask institutional power in visions of AI-based governance. Ultimately, AI's rebranding showcases how corporate interests can rapidly reconfigure academic fields. It also brings to light how a nebulous technical term (AI) may be exploited for political gain.

Promising performativity. Qalculating clinical performance? *Roland Bal, Erasmus university rotterdam; Iris Wallenburg, institute for Health Policy and Management*

STS scholars have well pointed out the politics of numbers, highlighting how numbers intervene in practices, bringing into being particular value systems rather than 'just' reflecting their performances (Callon 1998; Verran 2001). Cases in point are scores on performance indicators for professional organizations such as universities or hospitals and the subsequent 'ranking' of their performance (Wallenburg et al. 2016). This 'reactivity' to numbers, while taken up by scholars as a critique of numbering practices (Espeland and Sauder 2016) hardly is a surprise to practitioners—that is, policy makers, regulators, and, in case of health care, (associations of) physicians and nurses—anymore either. Although some stubbornly attempt to combat these effects, casting reactivity as a threat to the validity of counting practices, others view reactivity as 'a promise', seeking to create a form of reactivity that causes people to change their behavior in desired ways. We encountered such policy attempts in our research on the construction and use of performance indicators among the Dutch Healthcare Inspectorate. While we had pointed out the reactivity of their work in earlier research projects, they now embraced this insight, anticipating the (wished for) futures of performance indicators to enhance quality of care. Moreover, inspectors actively and enthusiastically consulted us, STS scholars interested in the politics of numbers, to enhance insight in their own performative work. In this paper, we explore our (unexpected) reflective consultancy work as a form of qalculation (Cochoy 2008), rendering STS analytics in collective work of understanding and experimenting with the world making practices of numbers.

Session Organizer:
Radhika Gorur, Deakin University
Chair:
Helen Verran, Charles Darwin University, Casurina, NT

069. Beyond Boundary Objects and Immutable Mobiles - New Ways of Thinking about the Movement of Knowledge III: Co-Production of Knowledge
Papers for Open Panels/Beyond boundary objects and immutable mobiles: new ways of thinking about the movement of knowledge
Open Panel
2:00 to 3:30 pm
ICC: E5.4
Knowledge has been a central focus in Science and Technology Studies for quite some time, in particular its production and dissemination. To talk about the latter, STS scholars have developed concepts like boundary objects, immutable mobiles, and trading zones; concepts that draw attention to the knowledge objects that offer flexibility or stability or are being exchanged. This open panel explores new and other ways of in detail tracing the everyday practices, structures, and relations that make knowledge travel from one site to another.This session adresses important aspects of co-production of knowledge.

Participants:
Opening the Black Box of Interdisciplinary Collaboration: Cognitive Maps of Knowledge Sharing in Research Teams *Lianghao Dai*

The question of how scientific knowledge is shared and integrated in interdisciplinary collaboration has been widely discussed in the Science and Technology Studies. Much attention has been focused on the 'bridges' linking different sets of terminology and methodology from various disciplines. Boundary object, for instance, is one of the main concepts to describe this kind of 'bridges'. However, the process of building or maintaining these 'bridges' will be still hidden in a 'black box' if we lack a tool of analyzing their structure and dynamics. By conducting a case study on an interdisciplinary collaboration effort of a group of computer scientists, social psychologists and physicists in a German university, this contribution shows that the cognitive mapping approach is a useful tool. Compared to 'boundary object', it provides a clearer and more dynamic picture of building and maintaining 'bridges' in interdisciplinary research teams. Moreover, it is used not only to describe the structural patterns of knowledge sharing in the progress of interdisciplinary collaboration, but also to depict the division of labor among researchers as well as their various ways of dynamically constructing shared knowledge. Key words: interdisciplinary collaboration, cognitive map, boundary object, structure,

dynamics

Learning By Transacting: Making, Learning And Sharing Knowledge In The 'Cities Of The Future' Laboratory *Lina Ingeborgrud*

Urban laboratories are often used as a strategy to produce innovative knowledge to improve the sustainability of cities. In this presentation, I show how the concept of 'the learning economy' (Lundvall & Johnson, 1994) can be used to account for how these laboratories make and share knowledge to address sustainability concerns. A learning economy comprises what I call 'learning by transacting'. Learning by transacting denotes the practices by which actors exchange, or transact, ideas and relevant experiences in stronger or weaker relations. By contrast to concepts of 'trading' and 'exchange', learning by transacting points to a goal-oriented type of knowledge sharing, in which learning is a central aspect of the process.   In my empirical study, a multi-actor urban program called Cities of the Future (CoF), the actors transacted visions, frames, narratives, best designs and people to improve the sustainability in Norwegian cities. I call the CoF program a 'meta urban laboratory' because it coordinated and facilitated learning by transacting between what I see as more 'classic' urban laboratories in CoF, organized as 45 pilot projects. The CoF program tried to provide a learning economy for the sustainability of Norwegian cities. My data consist of 25 interviews, one month of shadowing two planning agencies, document and newspaper analysis. I analyzed data through a sociomaterial and practice-based approach to learning, such as the social learning of technology framework.

Stanley Milgram and the Sonic Imaginary *Trevor John Pinch, Cornell University*

This paper is part of the larger project of thinking through the implications of the new interdisciplinary field of "sound studies" for social science methodology. How does the emphasis upon sound change the way we think of, say, experimentation in social psychology? Taking Stanley Milgram's early experiments as my example, I point to the crucial role played by sound in some of those experiments. Milgram's Harvard PhD Dissertation in particular was based upon transforming Asch's well-known visual experiment on conformity into a sonic experiment (by comparing the lengths of two sounds rather than two lines and by replacing confederates with tape recordings). Furthermore, sound played a crucial role in Milgram's famous obedience experiments where the supposed working of the fake electric shock machine was simulated through sound effects and where the supposed trauma of the victim was again rendered sonically. This role of sound seems to have been largely ignored up until now and is worthy of attention.

Ecologies of Expertise: Re-Evaluating Brokering in Knowledge Co-Production *Ronlyn Duncan, Manaaki Whenua Landcare Research; Melissa robson, Manaaki Whenua Landcare Research; Sarah Edwards, Lincoln University*

In knowledge-based societies characteristic of Western democracies, 'brokers' are increasingly required to navigate heterogeneous ontologies, epistemologies and practices in order to help communities deal with the challenges posed by 'wicked' environmental issues. Popularised in the work of Roger Pielke, brokers that are 'honest' and strive to open-up rather than close down options are assumed to pave the way for the movement of scientific knowledge into policy. Yet, little is known about what brokers actually do in practice, what factors influence the courses they chart, and their transformative role in the movement of knowledge. This paper presents the findings of qualitative interpretive research conducted across New Zealand's South Island region of Canterbury where deliberate efforts and institutional changes have been made by regional government to change the way technical expertise is produced and mobilised with roles for brokers created to support collaborative decision-making processes. The findings illustrate the complex facets of brokering and the multiple scales at which knowledge co-production takes place. This paper opens important questions about current conceptions of knowledge translation and movement and links the findings of the research to the STS strands of the 'knowledge ecologies' literature.

State Spaces and Boundary Infrastructures *Dylan P Brady, University of Oregon*

The everyday function of the Chinese rail network requires that tens of millions of individuals deliver themselves to precisely the right place at the right time. The discursive-material system that enables the rail network to function consists not just of the signs and spaces of the stations and carriages, but of the fluencies and flows of the passengers. Knowledge is firmly situated in place to enable people to move. Investigating this infrastructure thereby inverts the typical question of STS, rendering "how does knowledge move?" into "how does mobility become known?" What ways of being in the world does it generate, and how are they known? Based on six months of participant observation within the Chinese rail system and interviews with Chinese travelers, this research aims to synthesize the work of STS thinkers like Haraway and Barad on discourse and materiality with the work of theorists like Lefebvre on state and space. This research investigates how rail infrastructure both joins and fractures national communities and state spaces, existing simultaneously as monumental re-workings of society and as an invisible backdrop for everyday life. This research recuperates the practices of rail passengers as not just performance, generative of meaning, but as a form of work, producing material change at scales ranging from the embodied to the national. Chinese rail is hidden in plain sight as it subtly but pervasively reorganizes the spaces of the Chinese nation.

Session Organizer:

Hannah Grankvist, Department of Thematic Studies - Technology and Social Change, Linköping University

070. STS Underground: Responsible and Sustainable Mining

Papers for Open Panels/STS Underground: Investigating the Technoscientific Worlds of Mining and Subterranean Extraction Open Panel

2:00 to 3:30 pm

ICC: E5.5

This is one of three sessions that aim to bring together international scholars whose work addresses technologies, practices, and forms of knowledge related to the subterranean, including the mining of minerals, groundwater and fossil fuels. This session focuses on discourses and case studies of sustainable and responsible mining from across the world.

Participants:

How to build a body in a minescape: toxic conditions in artisanal gold mines *jessica worl, University of Michigan-School for Environment and Sustainability*

Artisanal and small-scale gold mining is a toxic practice. Every day, according to media and policy publications, approximately 15 million individuals worldwide toil under harsh work conditions, exposing themselves to toxic heavy metals, dangerous work conditions, and even death. Characterized as a "poverty-driven" activity, it is both vilified for its poor labor conditions and environmentally destructive practices and lauded for its ability to maintain and support the economic security of individuals forced to live life "on the margins." Drawing from the literature in environmental justice, ecological anthropology, and political ecology, I explore what it means to be a miner working in an artisanal gold mine. Adopting Appadurai's suffix, -scape, to think of the mine as a minescape, it explores how miners build themselves safe bodies in a precarious place and seeks to reconsider the limits of our understanding of the word "toxic" and how particular people, places, and practices get defined as toxic. Is toxicity simply limited to "matter out of place"; matter which disrupts the physiological and neurological functioning of our bodies? Can the concept of toxicity be expanded to include the conditions that allowed for the production and maintenance of minescapes? This work contributes to STS research on toxicology, occupational and environmental risk, and the Anthropocene to rethink how toxicity is made real and tangible, how occupational and environmental risk is made normal and acceptable for miners, and how conditions in artisanal mines are maintained and stabilized despite increased attention to labor and environmental practices.

Mining renewal » in metropolitan France? The controversial definition of a « responsible mine » model. *Julien Merlin, Mines Paristech; Yann Gunzburger, Ecole des mines de Nancy; Brice Laurent, Ecole Des Mines De Paris*

In 2012, the French minister of economy Arnaud Montebourg, followed by Emmanuel Macron, heralded the opening of an era of "mining renewal" (renouveau minier) in metropolitan France. After decades of decline, mining activities would again be on the rise. The government called for a comprehensive inventory of mineral resources, the delivery of exploration permits to junior companies, and launched a collective reflection on "responsible mining". This paper proposes to study the concept of "mining renewal" and explore its political consequences, through an analysis of the various controversies surrounding it. We use empirical material related to mining projects in French Brittany and the department of Ariège, and to the national initiative on "responsible mining". We focus on two areas of contestation, which delineates the political economy of "mining renewal", and the alternatives it has given rise to. First, we discuss the notion of "responsibility" and its definition in the "responsible mining » national initiative. We show how environmental civil society groups, who participated to the initiative, contested the responsible mining model promoted by other actors involved in the initiative. Second, we show how the narration of the past is used to problematize future development. As past mining activities are considered as valuable heritage by some, historians are enrolled to participate in the production of a would-be responsible mining model. This mobilization of the past is opposed by other actors, who propose counter models for the valuation of local territories, and re-distribute the ability to define the objectives of « responsible mining ».

The (Un)Making of the "Grants Uranium District": The Technopolitical Life of the Byproduct in Northwestern New Mexico *Thomas De Pree, Rensselaer Polytechnic Institute*

During the second half of the twentieth century, New Mexico served as the primary production site for the U.S. Cold War project of stockpiling nuclear weapons. From 1948 to 2002, the "Grants uranium district" first sourced the uranium ore necessary for building one of the world's largest nuclear arsenals; after 1971, it became a national source for nuclear energy. By the beginning of the twenty-first century, uranium mining had ceased in New Mexico, leaving a legacy of environmental health impacts from the mine waste left onsite. In addition to airborne and gamma radiation, the contamination of groundwater in this arid region poses serious biophysical, sociocultural, technoscientific, and political-economic problems. Characterized broadly in terms of ecological "sacrifice zones," the history of uranium mining and milling constitutes profound cases of environmental injustice and environmental racism, as well as deeper impositions of settler colonialism. The "Grants uranium district" encompasses parts of Acoma and Laguna Pueblos, the Navajo Nation, as well as Hispano and Anglo settler communities. In this paper, I describe my ethnographic and archival research on the problem of mine waste and the ways diversely situated social actors attend to the processes by which uranium tailings and other harmful byproducts cascade into the high-desert ecology of northwestern New Mexico. My central argument is critical of the promise that technology will ultimately usher in a benevolent future; instead, technology becomes entangled with politics of difference through nature and culture in processes of environmental monitoring and cleanup.

Urban Mining: A New Epistemology for Social Justice *Roopali Phadke, Macalester College*

The global conversation about mitigating climate change is now driven by an almost singular focus on deep decarbonization, or the electrification of everything. Many imagine our future lives as powered by stored electricity, derived from renewable sources. The grand challenges of the Anthropocene includes balancing our global dream to electrify everything with the brutal fact that clean energy technologies depend on metals mined using nearly medieval techniques. This paper explores urban mining as an alternative. Urban mining is defined as the recycling of materials from the technosphere: the buildings, industrial facilities, and consumer devices that make up our lives. Urban mining constitutes an emergent epistemology. It is distinct from "virgin" mining, not just because of its non-rural geography, but in terms of the infrastructures, institutions, and instruments employed. Urban mining also constitutes a form of disruptive innovation that shifts patterns of consumption and waste collection. To crack open this new epistemology on mining, I investigate urban mining as an assemblage of discourses, objects, practices and subject positions. I am interested in who urban miners are and how they collect valuable metals. I explore the multitude of training and

research programs taking hold in Europe, which are light years ahead of US trends. I theorize that this lag is rooted in a vastly different continental resource geography, deeply seated antagonism between the urban and rural, and a uniquely American consumer psyche -- all in the context of a pro-mining Trump agenda.

Session Organizer:

Roopali Phadke, Macalester College

Chair:

Abby Kinchy, Rensselaer Polytechnic Institute

071. Environmental Humanities, Science Studies, and Transdisciplinary Engagement
Closed Panels
Traditional (Closed) Panel
2:00 to 3:30 pm
ICC: E5.6

Environmental humanities has gained force as a vital contribution that aims to work in dialogue with the sciences around issues related to climate change, extinctions, biome damage, technological and infrastructural innovation, and the possibilities and limits to environmental justice. This panel is comprised of scholars working on the environmental humanities as it interfaces with diverse sciences and science studies in South Africa and Latin America and the particularity of debates over the limits to scientific mastery and universalism. We understand the emergence of the environmental humanities as a multidisciplinary field in the twenty-first century to reflect a growing awareness that responses to the socio-environmental dilemmas now being faced require the collaborative work of not only diverse scientists, but also more expansive publics, including artists, urban and rural communities and their relationships with nonhumans and materialities. Our papers reflect on moments when generative transdisciplinary thinking emerged or was foreclosed during field research in South Africa, Colombia, and Chile, whether in terms of translation across different practices, issues of scale, the force of economic structures, colonial and extractive legacies, and everyday militarization and social and armed conflict. We collectively explore the possibility to strengthen environmental humanities' engagement with the sciences in ethnographically driven work in the global South with a focus on moments of newly shared insight, mutual incomprehension, and partial connection.

Participants:

Science, Nature and Justice in Times of Conflict and Transition *Kristina Lyons, University of Pennsylvania*

Issues of war crimes, violence, and dispossession have primarily focused on humans as victims and actors within legal frameworks concerned with the defense and violation of human rights and international humanitarian law. In Colombia, there has been emergent public debate over the ways soils, rivers, forests, and biodiversity, among other living beings and "natural resources," are also casualties of war, requiring reparative treatment in the country's officially declared post-conflict and transitional justice process. While environmental coalitions and popular movements have proposed constituting an Environmental Truth Commission to reconstruct the environmental memory and work towards the integral reparation of diverse socio-ecological conflicts, many scientists argue that no baseline scientific knowledge exists for much of the country's rivers, forests, soils, or geomorphological conditions. This is due to the fact that territories were impenetrable, and thus unoccupied by the State and unexplored by scientists,

during times of war and the presence of armed groups. In this paper, I discuss the efforts of rural communities to reconstruct the ecological memory of a particular watershed in the Amazon, which has been affected by illegal mining, among other extractive activities entangled with histories of colonization and armed violence. I focus on the shifting roles of "science," and "nature" in peace-building efforts in historically militarized zones, and the kinds of participatory baselining that may emerge in community-led ecological restoration. I also discuss the perpetuation of violence and new risks that result when conservationist priorities changes hands from paralegal-armed actors to police and military forces of the State.

Baboons, Citizens, Science and the City *Lesley J F Green, University of Cape Town*

Current official practices of baboon knowledge production and management in the City of Cape Town rest on data-driven demography that is intended to minimise human-wildlife conflict. It is a matter of both curiosity and concern that an aggressive relationship with the baboons has come to be endorsed as the only viable relation humans might have with undomesticated urban animals in the city. The performance criterion for the current baboon management team is that the baboon troops must be on the far side of the urban edge 80% of the time. The rise of the great urban machines of our time, requires that we rethink the assumption that undomesticated animals have no place in urban environments. This paper argues that the task of overcoming human exceptionalism in the City of Cape Town, is a matter of thinking through and with animals' relations with urban spaces, of addressing the practices of apartheid urban spatial management, and questioning the increasing militarisation of conservation science. Recognising the profound entanglements of gender, race, and militarisation with current practices in which animal demography has metamorphosed into a "zoo-criminology" that generates a killability index for individual baboons, I argue that the methodology of ennumerating and tabulating individual animal behaviour, in the managerial regime of the moment, leaves decision-makers without insight into the relational "becomings with" that are at work in the violence currently attending human-baboon interventions.

"This is not political, it's technical": Science, environment, and unions in defense of the public *Gloria Baigorrotegui, Instituto de Estudios Avanzados - Usach; Maria Paz Aedo, Universidad de Santiago de Chile*

The complicit relations between governments and transnational conglomerates are usually analyzed from the collective actions allied with NGOs to denounce the fraudulent use of science in favor of the installation of extractive projects. Controversies between the technical and the political, or the private and the public, in environmental impact assessments are traditional in STS studies. However, the controversies located in the same public institutions and, in particular, those originating from the unions of the environmental administrations are lesser known. In Chile, a use of the technical has been recognized as a strategy of depoliticization allied with neoliberal technologies and dictatorial sciences. In this paper, we propose to follow the use of the "technical" and the "political" as strategies to defend the public. We will focus on the trajectory of an alternative commission

known as the Citizens-unions-parliamentary Commission between 2015 and 2017. This Commission proposed reforms to the Environmental Impact Assessment System in an unprecedented way in the country. Public unions, NGOs, and academics worked on the margins of the presidential reports and presented an alternative report where not only the need for science in favor of the protection of socio-ecological habitats was raised from a public, more participatory and decentralized approach, but also the need to protect the physical integrity of public officials. We also discuss the way hostile and violent modalities are found in the practices and bodies of officials, environmentalists, and scientists when technically justifying the inappropriateness of specific intervention projects.

Hoping from water fluctuations *Diana Bocarejo, Universidad del Rosario*

To tell the story of riverside or coastal communities along many of the rivers, oceans and wetlands around the world is often a narration of the ebbs and flows of water. Ebbs and flows of water are in fact shaped by the comings and goings of many beings, compounds and things that are related with each other, intentionally or unintentionally: fish, cattle, ants, people, algae, trees, mercury, cadmium, bridges, dikes, or hydroelectrics for example. I study how the expectations of fishermen and peasants of the Río Magdalena in Colombia, about "becoming with" water, are grounded in certain entanglements- or I would say enmarañamientos in Spanish. The practices and languages around those entanglements come from different lived experiences, knowledges, and disciplines, that most often do not talk to one another. But when they do, they may spark new ideas and possibilities that help to reframe the strong and isolated views around water management that divides and defines the discrete entities (social, economic, environmental and political) of typologies such as those of ecosystem services. This presentation reflects on the possibilities opened by the dialogues between fishermen and peasants, anthropologists, engineers, lawyers and biologists for reframing local water governance. Such dialogues hinge upon the different affects associated with the river's coming and going that evoke longing, frustration, desire, joy, fear and a sense of rootedness defined through complex social and ecological interrelationships. Any form of local water management is thus traversed by a fluctuation between ecologies of abundance and ecologies of fear; stories of a past of abundance in the fishing trade and harsh memories of floods and droughts. I study how "thinking with water" means living and hoping from fluctuations, and how new ways of thinking about local water governance may be driven by unexpected dialogues.

Session Organizers:
Kristina Lyons, University of Pennsylvania
Lesley J F Green, University of Cape Town

072. COMPOSTING Feminisms and Environmental Humanities 3: Pedagogies
Papers for Open Panels/Composting Feminisms & Environmental Humanities
Open Panel
2:00 to 3:30 pm
ICC: E5.7
Imagine the process of reading and writing as composting. Matters break down and re-emerge as new matters. In the spirit of a

feminist politics of citation, how might we attune ourselves to the ways in which new ideas are always indebted to writings, readings and practices that have come before? What and how are feminist genealogies composted in and through the Environmental Humanities? What concepts are especially fruitful, and why? In what forms do these ideas re-emerge? How are these genealogies acknowledged? What ideas are yet to be added to the Science and Technology Studies (STS) compost pile? Composting, as a feminist practice, has been taken up by a University of Sydney-based reading and research group of cross-institutional, trans-disciplinary scholars exploring the traces, legacies and intersections between inclusive feminisms and broad Environmental Humanities. Started by Dr Astrida Neimanis and Dr Jennifer Mae Hamilton in September 2015, the Composting Feminisms and Environmental Humanities group wishes to connect with transnational composting kin through this open panel at 4S. STS & Environmental Humanities share many key feminist interlocutors and this panel is an opportunity for discussion of similarities and differences.
Participants:

Making Academic Kin: Composting Subjectivities In Graduate Research *Blanche Verlie, Monash University; Sherridan Emery, University of Tasmania; Maia Osborn, Southern Cross University; Kim Beasy, University of Tasmania; Kevina Kezabu, University of Tasmania; Bianca Coleman, University of Tasmania; Jennifer Nicholls, James Cook University*

Reading and writing are central to most national education and research systems and are thus technologies that (can) contribute to reproducing the nation state. Operating simultaneously as education and research, PhDs epitomise this, and in Australia, like many other overdeveloped nations, they are situated in and co-constitute competitive, market driven ideologies (aka neoliberalism). This contributes to the ongoing cultivation and fetishisation of detached, individualistic, autonomous, rational, modern, white-heteromasculine subjectivities that STS, feminist, Indigenous, postcolonial, crip and queer scholars and activists have critiqued. Unsurprisingly, graduate students are often plagued by anxiety, stress and feelings of isolation in their journeys of becoming researchers in this socio-economic environment. In this presentation, we take Composting Feminisms' provocation to think of reading and writing as practices of composting ideas, and argue that learning more generally can be a process whereby subjectivities and identities can be composted. We discuss how forming a transnational, cross-institutional network of graduate and early career researchers in environmental education enabled us to compost ourselves through the PhD process. Collectively, we decomposed hierarchical, individual, competitive subjectivities and enabled more caring, collective, subjectivities to be composed from this compost pile. This process of making kin (Haraway, 2016) transformed our experiences of becoming researchers, and composed a form of refuge from the transnational, neoliberal driven academic stressors.

Art-science Activisms and Compost Methods for Common Worlds Pedagogies *Alicia Flynn, Melbourne Graduate School of Education (University of Melbourne)*

Art-science activisms as articulated by Donna Haraway (2016) have emerged from informal and community context. Here I present them as a way of engaging common worlds pedagogies (Taylor, A., & Pacini-

Ketchabaw, V., 2015) in schools that signposts a more-than-scientific way of knowing Earth systems in our local places. Here, I perform examples of the art-science activisms that are materialising as learning-teaching practices and research methods in my PhD inquiry with a high school in Naarm/Melbourne. To fertilise the more-than-human 'field' of place pedagogies and ecological education research, the entangled methods in this research are dubbed 'compost education' (Haraway, 2016). By turning lessons from ecology and place pedagogies into a hotter compost pile with feminist-material, anticolonial, participatory practices as 'common worlds pedagogies' (Taylor, A., & Pacini-Ketchabaw, V., 2015), I try to make sense of how weekly, arts-based, interdisciplinary learning outside the classroom is a transversal act that takes multispecies lives seriously. Over time and in diverse ways, students, teachers, participant-researchers have been performing relational, art-science practices that generate a sense of immersion in a more-than-human agential reality (Barad, 2007). These humble, seemingly insignificant, embodied practices increase our (students, teachers, researchers) capacity to imagine the relationships and events that are otherwise so big they are imperceptible or so small they are invisible. Practices that just might contribute to fashioning fertile places and building common worlds pedagogies at high school beyond the polemics of despair or hope (Haraway, 2016) that are fit for these precarious times. Key words: common worlds pedagogies; compost methods; multispecies; art-science activisms; praxis; more-than-scientific; more-than-human; speculative feminisms; ecological feminism; anticolonial; place pedagogies; entanglement

Integrating Feminist STS into STEM – Examples from the Environmental Sciences *Petra Lucht, Technical University Berlin*

"How can feminist studies in science, technology and society (Feminist STS) become integrated into research and teaching in science and technology?" In this paper I present how Feminist STS may become an integral part of study projects and qualifying theses of bachelor, master and doctoral students in STEM fields including the Environmental Sciences. An exploratory, constructivist teaching-research approach opens up time and space for reflections, inventions and transformations of defining and carrying out a pre-defined research task. Three phases of pursuing this work are being distinguished: The seminar starts with choosing and explaining a pre-defined assigned task in a particular field of science and technology. During the second phase students learn to analyze how this pre-given task is 'gendered' with regard to its contexts, concepts, theories, research questions, prospected results, applications and possible uses. Through referring to an integrated research design model of qualitative research ("Hourglass Model", Maxwell) students explore and discuss interconnected ways of gendered aspects of the task they are about to solve. During the third phase of the seminar students focus on reflecting, on re-shaping or on transforming the pre-given task that was framed in a field of STEM to a project that integrates feminist STS scholarship. In the paper for this conference examples from environmental sciences will be presented to illustrate the outcomes of this teaching-research approach within feminist STS. The seminars are part of the study program "Gender Pro MINT" at the Technische Universität Berlin at the Center for Interdisciplinary Women's and Gender Studies. http://www.zifg.tu-berlin.de.

EcoFeminist Fridays: towards slow academia *Hayley Singer, University of Melbourne*

EcoFeminist Fridays is a weekly, two-hour, 'read-in' session made up of artists and scholars committed to traversing the texts that make up the histories of critical ecological feminist thought and action. The structure of the group is simple: we sit and read aloud together, as a collective. This group was started in response to two experiences of fragmentation that seem common within the academic setting. The first comes from the expected acceleration of "knowledge production", which is compounded by the casualisation of work and lack of dependable practical resources (such as desk space, computer, book shelf or locker) offered by universities. The concretion of these experiences seemed to amplify the kind of environment that produces what Deborah Bird Rose has described as "disengaged and fragmented forms of knowledge." ('Slowly' 2013) The second experience was the desire to turn to a community with a shared body of critical ecological feminist knowledge, but not knowing where that community resided. This group was started to provide a physical and imaginative space for a community to gather. It now acts as a kind of refuge in which the words of critical ecological feminist to be read aloud and heard. It pushes against the frenetic pace of its surrounding academic setting with slow, emergent and collective modes of learning. In this paper I reflect on the experiences that emerged from the first year of reading sessions. I will discuss the 2017/2018 reading lists, and the projected program of public 'read-ins' from the perspective of composting feminisms.

Audio Journeys, Visualisation and Dark Lessons *Julie Vulcan, Western Sydney University*

I am proposing an audio work to take listeners on a journey underground into the dark compost pile of creative acts and earthy biomes. My independent research has involved the dark in relation to culture, the imaginative and ecology, while considering notions of the disappearing dark. My provocation is how we might re-embrace darkness as a biological, emotional and creative imperative for future survival at a time when our technological lifestyles demand longer light saturated hours. What are the lessons we can learn from our multi-species inhabitants who cultivate complex systems in relation to light and dark? In 2017 I created the first of an ongoing series of audio casts, in which I guided the listener underground to inhabit the world from the viewpoint of mycorrhizal fungi. For this panel I delve into the compost world and fungal gardens of leaf cutter ants. The audio works blend fact and fiction, with a dash of the wry and aim to plant a seed of possibility that could be mirrored in the human species world. A segment of the audio work could be presented with a brief supporting introduction and the full version could be made available for attendees to listen to in a break. The dark fecund (under)ground of the unseen – domain of women, queers and activists deemed unfit for the Man and Nature binary - is where I plant my research in an effort to subvert such paradigms. On the back of Helene Cixous imploring me to explore the dark while laughing with the Medusa, who

- as Donna Haraway suggests - needs her tentacular allies, I look toward Anna Tsing's notion of a "third nature" where life engages with it's entanglements despite and in spite of capitalism.

Catalyst actors and sub politics enacted in gender balance reforms in/of academic institutions *Vivian Anette Lagesen, NTNU; Siri Øyslebø Sørensen, Norwegian University of Science & Technology (NTNU)*

Gender equality and gender balance in academia is still an area in need of more knowledge and better inclusion instruments. In this paper, we ask who are the catalyst actors that are needed for success in gender equality work in academia and what strategies do they employ? What kinds of sub politics exist and are encountered in gender reform work? To answer these questions, we analyze three instruments of gender reform; gender equality plans, university strategy plans, and department heads. The case is the largest university in Norway, NTNU Norwegian University of Science and Technology. We have collected three sources of data. First, gender reform and general strategy documents from the top level and the Faculties. Second, a survey of all department heads at NTNU. Third, in-depth interviews with twelve department heads. Gender equality strategies are produced at the top level and articulated through strategy documents and action plans. However, it is the department heads who have been designated the role as change agents in producing the actual gender reform. This means that they navigate goal-oriented policies from above and often vague and contradictory sub politics from below. How do the department heads interpret and handle this situation? Are they able and willing to enact the role of gender balance catalysts? We found that there are large variations in strategies employed, what kind of resources they see as available, the perception of agency they have and the dilemmas and sub politics they are facing when enacting gender reform expectations.

Session Organizer:
Lindsay Kelley, UNSW Art & Design
Chair:
Jennifer Hamilton, Hampshire College

073. Diversifying Agri-food STS Scholarship Across Transnational Borders I
Papers for Open Panels/Diversifying Agri-food STS scholarship Across Transnational Borders
Open Panel
2:00 to 3:30 pm
ICC: E5.8
We welcome papers on a wide range of agricultural and food topics, with a view to expanding STS scholarship into new areas. To date, much STS work on agri-food topics has focused on genetically engineered foods, the Green Revolution, and industrial agriculture. However, as Iles, Graddy-Lovelace, Montenegro, and Galt (2017) suggest, food systems are complex, multi-dimensional, and involve long supply/trade chains that stretch around the world. Agri-food STS is rapidly growing to encompass many 'new' sites, geographies, and agricultures. Possible topics include the regulation of food safety and pesticide risks, the politics of agroecological knowledge production vis-à-vis industrial food regimes, farmer-to-farmer learning exchanges, the growth of automation (e.g., drones and mechanized harvesters), and new generations of genetically engineered crops (e.g. CRISPR). The connections between nutrition and health are of interest.

Corporations are developing and marketing an array of foods and diets for developing regions. Standards also continue to coordinate across huge agri-food infrastructures, and to define what sustainability means for supermarkets. Ongoing corporate consolidation is having a major impact on the nature of S&T in agri-food systems (e.g., seeds, chemicals, labor). In particular, we encourage contributions regarding agriculture and food systems in Australia, New Zealand, and the Asian region more broadly. We will organize specific panels around clusters of key themes and concepts, paying attention to stimulating transnational conversations between scholars working on these themes. We are especially interested in papers that critically appraise (1) efforts to foster sustainable intensification and (2) the development of alternative, sustainable agricultures.

Participants:

Expert and public attitudes on the use of gene editing: An empirical study in Agri-food context *Naoko Kato-Nitta, The Institute of Statistical Mathematics, Japan; Nagoya University, Japan; Tadahiko Maeda, The Institute of Statistical Mathematics, Japan; Masashi Tachikawa, Nagoya University, Japan*

While the recent emergence of gene editing technologies has attracted wide attention from scientists, we have scarce empirical evidence concerning consumer attitudes toward application of such technologies on agricultural products. We quantitatively investigated this topic by utilizing two web-based surveys conducted in December 2016 to February 2017. The first survey used 3,000 samples from a large opt-in panel of online population in Japan. For the second survey, we adopted opportunistic sampling through academic societies' websites and mailing lists, and recruited 197 researchers both who have expertise in molecular biology along with researchers who have other fields of specialty. With those data, we statistically compared the level of peoples'risk / benefit perceptions for applying different technologies on agricultural products, i.e., attitudes toward conventional breeding, genetic modification, and gene editing, using repeated measure analysis of variance. Further, we examined how the expertise or scientific literacy influences those perceptions by contrasting the statistical results between researchers and lay publics. The results showed that people tended to have a more favorable attitude toward gene editing than genetic modification. Such improvements were however only a few extents among the lay publics or non-microbiology researchers, compared to conventional breeding. Trends in Experts' responses were significantly different from other two groups. Based on those empirical evidences, we discuss theoretical and practical implications for Agri-food STS and risk communication. Although the study is conducted in Japanese context, our approach should provide a deeper insight into a significant transnational discussion on new generations of genetically engineered crops.

How Technologies, Identities and Idylls Can Steer Research Through Changing Agrifood Regimes *Peat Leith, University of Tasmania*

Techno-scientific agricultural research has tended to be supported by governments and endorsed by powerful business interests, primarily to make production greater, more efficient and less risky. Yet family farms still dominate agricultural production, and with increasing consumer affluence and concern about food, there is concurrent diversification in agrifood production. Niche

and boutique production, collaborations between processors and producers, and development of vertically integrate businesses operating across value chains are widespread. Here, actors work to embed services (e.g. social identities or environmental outcomes) in their (food) products. Such forms of production rely on very different knowledge/power relations within agrifood systems to those oriented to increasing output, albeit within niches, and at the periphery. This paper advances STS scholarship related to socio-technical regimes through an analysis of approximately 100 in-depth interviews with food producers and processors across the diverse agrifood sector of Tasmania, Australia. Different forms of institutionalised knowledge production were identifiable, and linked to very differently constituted trajectories of agrifood regimes, and vice versa. The analysis (which is preliminary at the time of submission) suggests that regimes oriented by techno-scientific knowledge tend to be large-scale, hierarchical and commodity focussed. Yet, in Tasmania, with agrifood actors are considering opportunities well beyond increasing factor productivity, knowledge production is widely considered as pluralistic, distributed with minimal roles for science or the state in the co-production of products, values and identities. I close by considering how research might support such plural, socio-technical regimes and thus its own ongoing legitimacy.

Processed Foods, Nutritionism and Food Corporations *Gyorgy Scrinis, University of Melbourne*

Highly processed foods have come under increased scientific and policy scrutiny for their contribution to poor dietary patterns and health outcomes. But a debate now rages between nutrition experts as to how best to analyse and classify processed foods. On the one hand, within the dominant paradigm of what I call nutritionism, processed foods are reductively understood in terms of their nutrient profile, and particularly in terms of levels of single nutrients such as sodium, sugars, saturated fats and energy. This nutricentric paradigm also frames the understanding of the body and forms of malnutrition. By contrast, new approaches and classifications based on levels and types of processing and technological intervention have emerged to challenge this nutricentric framing, such as the concept of 'ultra-processed products' (Monteiro 2017). In this paper I examine the scientific paradigms and political and policy implications of this current debate amongst nutrition experts regarding food processing, particularly for food manufacturing corporations. The manufacturers of highly processed foods and beverages—ie. 'Big Food' corporations —have arguably benefited from the nutricentric paradigm as a means of marketing their processed products. I will examine how food corporations are continuing to draw upon, shape and capture the nutritionism paradigm to support and legitimise three nutritional engineering and marketing strategies in response to health concerns and aspirations: the micronutrient fortification of foods to address nutrient deficiencies; the reformulation of products to reduce harmful food components; and the functionalisation of foods for 'optimal' nutrition through addition of functional nutrients and ingredients. These companies thereby claim to not only be reducing the harmfulness of their products, but also providing techno-nutritional solutions to the problems of under and over-nutrition in the global North and South.

Unsettling Food Sovereignty in Australia *Christopher Mayes, Dea*

Food sovereignty is a concept used among grassroots agrarian movements seeking to give disenfranchised and landless peoples control over their food systems. Since the early 1990s, the global food sovereignty movement has been crucial for the advancement of the political rights and interests of approximately 200 million peasants, small and medium-size farmers, landless people, women farmers, indigenous people, migrants and agricultural workers throughout Central and South America, Africa, Asia, and parts of Europe. This movement seeks to establish 'new social relations free of oppression and inequality between men and women, peoples, racial groups and economic classes and generations' (La Via Campesina, Declaration of Nyéléni). In recent years, activists and small-scale farmers in Australia have mobilised food sovereignty politics in order to establish a more just food system. However, this paper argues Australia is quite distinct from other locations in which food sovereignty has been deployed. In this settler-colonial context, it is not indigenous peoples using the politics of food sovereignty, but the inheritors and beneficiaries of colonial violence and dispossession of Indigenous Australians. Furthermore, agricultural practices and technologies were central to nineteenth century justifications for the physical dispossession of Indigenous Australians. This history, and its contemporary effects, raises significant ethical and political questions for contemporary proponents of food sovereignty in Australia. This paper uses philosophical and historical methods to critically explore the role of agricultural technologies in processes of colonisation, and the problems and possibilities of contemporary agri-food practices and discourses in settler-colonial contexts such as Australia.

Session Organizers:
Alastair Iles, UC Berkeley
Gyorgy Scrinis, University of Melbourne
Chairs:
Alastair Iles, UC Berkeley
Gyorgy Scrinis, University of Melbourne

074. Caring across Borders: Materiality and Belonging in Transnational Families II
Papers for Open Panels/Caring across borders: Materiality and belonging in transnational families
Open Panel
2:00 to 3:30 pm
ICC: E5.9
Participants:

Proposing a person-centred approach for understanding the affective nature of new media in care contexts *Joanne Mihelcic, RMIT University*

The need to care for people in a way that is person-centred is commonly promoted in the contexts of health, ageing and welfare. Person-centredness is often described from the perspective of the carers which creates problems in terms of how we understand the experiences of those for whom care is 'designed' or directed. Though there is much discourse which espouses person-centredness as a theoretical concept, there is limited guidance which supports translating this theory into relational practice and

real-life contexts. This paper will present an experiential model and social constructionist grounded theory developed through research which focused on the unique perspectives of people diagnosed with early stage dementia. The relational processes for sharing and co-creating personal artefacts were analysed to understand their meaning and significance to the person. I will propose that this experiential model creates a useful tool for understanding the affective nature of new media in relationship to people and the material world. And, that the ability to ascribe meaning to these types of social activities supports a person-centred approach for the design of care contexts.

Rethinking digital inclusion and exclusion in the new media practices of older Australians *Andrew Simon Gilbert, La Trobe University*

There is growing scholarly interest in the ways the elderly are using new media technologies in their everyday lives. This interest has primarily been framed by a goal of enhancing and increasing the social inclusion of the elderly in their existing family and friendship networks, as well as in public life. Old age can be a time of increased vulnerability to social isolation and social exclusion. Hence, digital and online technologies may offer a potential way to mitigate these problems by breaking down spatial, temporal and physical constraints, and facilitating new opportunities for communication and connection. However, while keeping with the thrust of this goal, this paper presents research findings which challenge any simple conflation of digital exclusion with disadvantage or deprivilegeing. Drawing on qualitative interviews which explore themes of social support and technology use in the past and present lives of older Australians, this paper develops a nuanced discussion of the structural, cultural and material obstacles to their engagement with new communication technologies. Particular attention is paid to the agency older people exercise over managing their use of new media technologies, sometimes including their choice to exclude themselves from digital communication out of a preference for physical co-presence. Digital inclusion and exclusion must therefore be conceptualized as processes which occur in a feedback dynamic with other processes of social inclusion and exclusion. This paper is part of the ARC Discovery Project Ageing and New Media, led by Baldassar and Wilding.

Virtual Materialities: the 'thingy-ness' of co-presence and caring across distance *Loretta Baldassar, University of Western Australia*

The circulation and reciprocal exchange of caregiving across distance in transnational family relationships demands the use of ICTs and social media platforms. This care circulation is facilitated by the degree of choice of a range of ICTs available to network members (albeit with varying degrees of different types of individual access). The potential provided by this polymedia environment and the distant care uses it is employed for by network members can deliver a variety of effective forms of copresence experienced as a sense of 'being there' for each other, despite the distance. The resultant human-technology interaction underlines and emphasises the importance of human relations to the material world, of both technologies and nonhuman actors. Gille (2012) refers to this as methodological materialism, that is, the need to connect the social with the material. But more than this, the technologies themselves have a vibrancy, to use Bennett's (2009) thesis, which adds not only an additional layer of meaning - but also of materiality (thingy-ness) – to deal with. This paper will explore the 'thingy-ness' of both 'special transnational objects' that travel across transnational family networks of caregiving, as well as what we call the virtual materialities of caring and co-presence across distance drawing on findings from Baldassar and Wilding's current ARC project, Ageing and New Media.

"Would you like the idea of robot caregiving to your ageing parents?" Theory of care and a technological boundary in caregiving *Maho Omori, National Ageing Research Institute*

With the rapidly ageing population worldwide, there has been an urgent call for technological interventions to tackle issues associated with it. A variety of technologies has been in place to assist old individuals to live safely, comfortably, healthily and independently for as long as possible. The public has held high expectation towards (bio)medical technologies to treat age-related health issues. With advanced information technology (e.g. 'smart technologies') old people's safety inside a house can be monitored remotely. Moreover, social networking sites possibly help reduce levels of loneliness caused by isolation among elderly people through 'connecting with others' online. However, when it comes to robotics technologies, discussion turns into a negative tone. While robotics engineers have being seeking a potential of robots being positively contributing ageing society, elderly care in particular, discussion of unethicalness surrounding utilising robots in care settings is always raised (e.g. Sparrow and Sparrow, 2006). This paper focuses on a technological 'boundary' in providing care and discusses how robots could be of good assistance in elderly care. Drawing on sociological theory of care, the concept of commodification of care, the law of robotics and culturally shaped perceptions of robots along with examining case studies of robot use in (aged) care settings in Japan, the U.S. and Europe, it endeavours to explore collective ethics and seek a possibility of robot use in elderly care through sociological perspectives.

Session Organizers:

Bianca Brijnath, National Ageing Research Institute
Loretta Baldassar, University of Western Australia
Maho Omori, National Ageing Research Institute

075. Smart Sydney: Studying the Smart City in Sydney, by Sydneysiders
Closed Panels
Traditional (Closed) Panel
4:00 to 5:30 pm
ICC: C2.2

Over the last decade, smart urbanism has become a major global trend as cities hunt for ways to take advantage of new information-communication technology (ICT). By deploying ICT—such as sensor arrays, digital platforms, autonomous vehicles, and control rooms—the city can be transformed into a data-driven, network-connected, smart system. Smart urbanism, especially the model propagated by large technology corporations, promises to solve social problems, spur economic growth, and secure control over the unruly, complex city. Much of the existing literature on smart cities has focused on critically analysing the visions, discourses, and technologies of smart urbanism. However, there is still need for place-based, empirical research on the actually existing smart

city. This panel brings together an interdisciplinary group of researchers who are empirically studying different dimensions of smart urbanism (e.g., governance, transportation, housing, and infrastructure). All of the research collected here is about Sydney and is conducted by researchers living and working in Sydney. Thus, the panel provides an in-depth analysis of how various smart initiatives are designed, deployed, and pieced together in the same city. This panel not only advances scholarship on smart urbanism, it also serves as a sociotechnical introduction to the city hosting the 4S annual meeting. Furthermore, this panel demonstrates how disciplines like geography and planning, which tend to be underrepresented in STS, can provide important insights about the spatial, policy, and political economic aspects of emerging technology.

Participants:

Logics, Aspiration and Practice of Smart in Sydney *Robyn Dowling, University of Sydney; Pauline McGuirk, University of Wollongong; Jathan Sadowski, University of Sydney*

Smart city strategies have multiple logics and aspirations beyond technological innovation. Anxiety-raising issues like accelerating urbanization are used to underpin the roll out of smart city solutions, as are aspirations to craft new urban economies through innovation. Alternatively, the implementation of smart initiatives is seen to improve citizen engagement, bolster sustainability efforts or produce efficiencies for government. Emerging work on the roll out of smart city logics emphasizes that the work that a smart agenda is expected to perform, and its actualization – its partnerships, institutional and material configuration – vary in context specific ways. In this paper, we investigate the logics of smart within one particular city – Sydney – as a means of exploring their variegation and contextualization. Although comparatively late adopters of the smart city approach, a plethora of smart strategies and projects are now emerging in Australian cities, including the Sydney greater metropolitan region (GMR). Through a focus on three unique cities within the Sydney GMR – Newcastle, Wollongong and Parramatta – we examine the articulation of logics, aspiration and practice across their smart city roll-outs. We do this by analyzing publically available local government smart strategies and supplemental interviews. While market logics and economic development aspirations are writ large in the urban Sydney landscape, we argue that wider logics and more open aspirations co-exist, derived from complex contextual histories, local technological and organizational capabilities. This has broader implications for analyses of making cities smart requiring attention to the incremental, the fine-grain, and local contexts.

RealTech and Foreign Real Estate Investment: 'Risky' East-West Cultural Asymmetries as Market Value and Extraction *Giulia Dal Maso, Western Sydney University; Dallas Rogers, University of Sydney; Shanthi Robertson, Western Sydney University*

In this paper, we analyse a digital real estate technology (known as RealTech) to push understandings of value extraction in platform capitalism into the cultural domain. We undertake a digital archaeology of a RealTech company Juwai – a foreign real estate investment technology that links Asian investors with real estate in key global cities such as Sydney. Our digital archaeology involved: (a) systemically using RealTech to map the digital actions and pathways that have been

coded into the platform and that direct user activity, covering both the English and Mandarin sides of the technology; and (b) collating and analysing all the publically available textual, visual and audio content from the technology and about tech company. The English side of the technology is aimed at educating Australian real estate professionals on the habits and practices of Chinese investors. 'Eastern' culture is essentialised in order to structure culture as a 'risk' that needs to be managed in international cross-cultural business transactions. The Mandarin side of the technology targets Chinese investors who are seeking to buy property in Australia. Here, complex 'Western' legal systems and the culturally situated business and real estate practices of the West are similarly imbued with risk for the Chinese investor. This allows Juwai to position itself as a digital cultural mediator, who can mitigate these risks and therefore ensure financial success across the cultural divide. We investigate how Juwai creates, recreates and promotes these cultural asymmetries to create market value and venture capital options for the company.

The Real-Life Adventures of Real-Time Transport Data in Sydney *Kurt Iveson, University of Sydney*

For advocates of the 'smart city', mobile apps that provide real-time information to users about the location of buses and trains are frequently cited as an example of how smart technologies make urban life better. However, while visions of smart cities tend to focus on what technology can do, we know that the introduction of any new technology into the urban field is a messy process, involving many actors and competing interests – the road to 'smart' can be rocky indeed. This paper examines the long process through which real-time transport information has been developed and made available to passengers in Sydney. It begins with 'yesterday's tomorrows', looking at how the possibilities of these technologies were imagined before they were developed. It then traces what happened over the next two decades, focusing especially on choices that have been made about the collection, licensing, distribution and accessibility of locational data. The paper offers a critical account of a socio-technical process whose trajectory has been far from linear, where new technologies have had to interact with old, and where some interests have been privileged and others marginalized. It thereby seeks to demonstrate that critical accounts of smart urbanism can benefit from attention to the interaction between smart imaginaries and their geographically- and historically-specific enactments.

The Elephant in the Room: Inequality of Telecommunication Infrastructure Across Sydney Metropolitan Region *Tooran Alizadeh, University of Sydney; Somwrita Sarkar, University of Sydney*

This paper builds upon the earlier discussions in the literature which introduce broadband infrastructure as an essential determinant of social equity and economic prosperity. It offers an overview of the equity concerns raised in relation to the ongoing rollout of the National Broadband Network – as the most dominant telecommunication infrastructure project in Australia – and speculates on some of the unintended implications across Sydney metropolitan region. By doing so, it opens up a timely conversation about one of the most vexing aspects associated with the NBN provision – so far – which is the lack of data transparency. Findings,

although limited by data restrictions, show a concerning pattern in which the already existing social divisions across Sydney could potentially be aggravated following the mixed-technology NBN. The paper calls for data transparency – in the age of big data – as one of pillars of just cities where smart is also equitable. Lessons learned may be valuable for other regions seeking to ensure equity in their telecommunication infrastructure provision and smart city investment; and can also inform Australian national policy in the NBN's remaining rollout.

Session Organizer:

Jathan Sadowski, University of Sydney

Discussant:

Donald McNeill, Western Sydney University

076. Transnational STS Media-Making: Producing Films and Videos for Research, Classroom and Beyond
Papers for Open Panels/Making transnational STS Films and Videos: Who, What, Where, How, and Why of crossing domains of sciences and technologies through media-making?
Open Panel
4:00 to 5:30 pm
ICC: C2.3

4S already promotes innovative ways of presenting research. It has been engaged with film/video for many years via the Making & Doing Project and screenings of Ethnografilm festivals' official selections at recent annual meetings. This panel builds on that foundation by convening filmmakers and video ethnographers to discuss their strategies for transforming their research into visual media that transgress research domains and offer alternative ways to generate scholarship. As media-making is a transnational global pursuit that transects regional, cultural, and linguistic differences, the panel can serve as a roadmap to future researchers with diverse research commitments and transnational, global projects who are considering this form to publish their work.

Participants:

Capturing Research on Film *Jarita Holbrook, University of the Western Cape*

Since 2006, I have been engaged with science documentary filmmaking. After creating films to inspire and to encourage STEM diversity, I undertook a three-year project studying the relationship between a small town and a large telescope in South Africa. I proposed that the research output be a film to be shared with the communities involved. The switch from inspirational documentaries to presenting complex social issues on film (in two languages) was challenging. The communities involved embraced my efforts, however other audiences have been not as enthusiastic. I invite discussion around issues of research integrity, popularization, STS audiences, and the life cycle of documentaries.

Ethnografilm and Filmmaking in STS *Wesley Shrum, Louisiana State University*

Since the establishment of the Ethnografilm festival in Paris in 2014, 4S and the International Social Science Council have played central roles. During the intervening years, the festival has expanded to venues in Africa, South Asia, and the U.S. Yet the question of what constitutes an ethnographic film has never been addressed, nor whether Ethnografilm should actually privilege some forms of filmmaking over others. The festival director discusses this issue in terms of (a) the festival review process; (b) the filmmakers who are invited to the festival; and (c) the response of the audience to the film screenings. The difficulties of establishing the boundaries of ethnographic film are intimately connected to the project of academic legitimacy for audiovisual media.

Researching Extraction, Refusing Extractive Research *Merle Davis, York University*

Drawing on the concept of refusal, this paper refuses extractive modes of research and instead asks; what does non-extractive research look like? In order to ask this question I consider what shapes the extractive paradigm, bringing together theories of capitalism and colonialism. My research focuses on a video shown in the Royal Ontario Museum produced by Barrick Gold that tells a story about the journey of gold from mine to market place. Reading this video as a colonial archive (McKittrick 2014), I examine both what is shown and what is erased or hidden from view. By focusing on this video I follow Tuck and Yang's (2014) suggestion to shift the researching gaze away from the pain of the colonized and toward those who cause and benefit from this pain, including those of us in the academy. Through focusing on this video I consider a variety of non-extractive modes of research. I ask what questions different modes of engagement allow me to open up and what avenues they close down. Throughout this process an ethnographic mode of exploration allows me to be reflexive in my engagement with different methods and to think through my role as a settler researcher. In considering this question in a way that refuses extractive research I story board a response to the video, thinking through questions of potential and power, intervention and exhaustion, audience and legibility and the politics of storytelling.

Fallout *Gordon Murray, University of Winchester*

This paper reflects on the outcomes of audio documentaries for which descendants of Nuclear Test Veterans were interviewed with an intention of creating a piece of verbatim theatre. The project however mutated into the creation of a series of audio portraits which mixed the recorded testimonies of the descendants with interviews with experts from other disciplines and dramatic fictional scenes, tying them together with narrative poetry. The descendants reflect on the ill health carried with them as a result of chromosomal transmutation caused by experiments on the other side a of the world a generation before them. The first part of the essay describes the creation of the pieces and the decisions behind the form and content. The attempt to reflect on the mutation from story to portrait draws heavily on the work of anthropologist Joseph Masco. 'Nuclear Children' often carry with them an embodied feeling of contradiction in which imperceptible change signals both development and decay. Part 2 is an analysis of the audio pieces with reference to Masco's concept of the nuclear uncanny. Masco's work on the individual, local and national psyche in America following the Manhattan project borrows from Sigmund Freud's famous notion of The Uncanny, in which contradictions between the strange and the familiar are embraced to create an anxiety which changes an individual's relationship with their surroundings.

Session Organizers:

Jarita Holbrook, University of the Western Cape
Vivian Wong, University of California, Los Angeles

077. The Learning Health System as a Socio-Technical System of Translation
Closed Panels
Traditional (Closed) Panel
4:00 to 5:30 pm
ICC: C2.5

The governance of life through algorithms and big data, e.g. 'social sorting' in automated systems, is a core STS subject. Whilst increasing amounts of personal data (in health, forensics, education, etc.) are generated at scale and deposited in databases, often a comprehensive approach to their analysis, use, and transparent governance remains lacking. This panel contributes to debates on the use of large-scale data agglomeration, analysis, and application in the life sciences, specifically in healthcare, by considering the ways in which STS can inform emergent systems using the example of Learning Health Systems (LHS). This panel will focus on LHS as a recent reframing of health information infrastructure and health care delivery that promises to leverage the significant amounts of patient and practice-generated data in efforts to reduce costs and medical error, and to improve health outcomes. However, data may be incomplete or proprietary, or may not reflect the realities of the publics they mean to serve thus falling short on the promissory note. This panel explores socio-technical imaginaries of LHS, and considers the role of STS in anticipatory analysis of social and ethical aspects of the emergence of various forms of such systems. The panel will be structured as one session of five speakers presenting empirical work, and one session as a roundtable to consider how STS may reveal the sociotechnical, political and ethical dimensions of emerging LHS and its role, if any, in informing governance.

Participants:

STS Enters the Imaginary of the Learning Health System: A Discourse Analysis of the Learning Health System in its First Decade *Minakshi Raj, University of Michigan; Jodyn Platt, University of Michigan Medical School; Matthias Wienroth, Policy, Ethics & Life Sciences Research Centre, Newcastle University*

New technological and information infrastructures are facilitating the collection, aggregation, and storage of clinical and research data within the healthcare system. The Learning Health System (LHS) concept emerged about ten years ago and encapsulates a new vision for the use of these data, shared across national and international networks, in efforts to improve quality, safety, and value in healthcare. Our paper traces the expansion of this sociotechnical vision in the peer-reviewed literature (2007-2016) to analyze the discourses around the LHS, and to identify trends and themes that shape its imaginary and frame efforts to bring it to reality. Several papers recognize the LHS as a "sociotechnical" system thus suggesting a bridge between STS and LHS implementation and an opportunity for STS research to inform evaluation and practice. For example, our analysis aims to identify what count as "successes" of the LHS to date, and which are the articulated priorities for realization of the LHS to inform system builders and policy makers. We have identified the need for leadership, an organizational culture of collaboration, and renewed meanings for valid research and care methodologies as key priorities in the extant literature on LHS. Since its early conceptualization, LHS discourse seems to be shifting from a vision and advocacy on behalf of the LHS concept to empirical reports of implementation and evaluation. A small number of papers have addressed the ethical and moral dimensions of the LHS citing the model as a moral imperative in need of renegotiating existing bioethical frameworks.

Imagining the Social in a Learning Health System *Alexandra Vinson, University of Michigan*

Learning Health Systems (LHS) offer a new way of organizing healthcare systems to promote patient engagement, evidence-based practice, and continuous improvement. This new structure promises to make use of patient- and practitioner-generate data sources to balance the often-competing priorities of high quality care and cost control. Since 2006, the National Academy of Medicine has brought together the Leadership Consortium for a Value and Science-Driven Health System, which has released a series of reports envisioning the structure and organization of the LHS. Along with the recently established journal Learning Health Systems, these reports serve as an archive for examining the socio-technical imaginaries of LHSs. In designing new systems is it important to ask: what aspects of healthcare as an everyday, social activity are articulated during system-oriented planning? Drawing on these archival sources, I focus on two stated goals of the LHS: to change the culture of a healthcare system so that it supports a continuously learning health system, and to shape patient and practitioner work to support this culture change. I draw on inhabited institutions theory and the STS concept 'configuring the user' to examine the conceptions of culture and work that are built into healthcare systems during the design phase. The goal of the analysis is to examine the status of the social in socio-technical imaginaries of the LHS as conveyed by planning documents, reports, and accounts of system change. In so doing, I will also advance a methodological point about how LHSs should be studied by systems researchers.

Bounded Justice: Learning Health Systems and the Ethics of Scientific Knowledge Production *Melissa Creary, University of Michigan, School of Public Health*

Based on empirical data collected on the ways in which science is co-produced for sickle cell disease (SCD) in Brazil, this presentation explores the ethical calculus of how scientific knowledge is legitimized for learning health systems. Bounded justice, as I define it, is an attempt to distribute health rights without disturbing the underlying mechanisms that generated initial inequalities. Its performance hinges on the historico-geographical context in which it is situated and can permeate any number of medical, social, and ethical realms. Using the new U.S.-based initiative "All of Us" as a case study, I will interrogate how inclusion and knowledge production are at odds with structural barriers and how justice-based scientific and public health policies are incongruent to the very justice they are trying to produce. Faden et. al. (2013) argue for "a specific, novel obligation on health professionals and health care institutions to be active contributors to learning in health care…and that a similar obligation extends to patients, who have traditionally not been conceived in research ethics as having a duty to contribute to the ongoing learning that is integrated with the health care they receive". This presentation asks the questions: how can we create a collaborative system of knowledge production that acknowledges both the societal barriers imprinted on marginal stakeholders? How do we navigate the tensions between what is deemed

historically legitimate by the standards of science in terms of learning in healthcare?

Healthcare As A System Of Systems And The Development Of Contingency Plans For Extreme Events *Denis Fischbacher-Smith, University of Glasgow; Bonnie Atonasova, University of Glasgow; Moira Catherine Fischbacher-Smith, University of Glasgow*

The annual winter pressures on healthcare that arise from seasonal flu push both health and social care to their performance limits as those patients with underlying health problems and the elderly require additional care that is beyond the 'normal' set of task demands that the service faces. This paper uses the experiences of the 2018 flu outbreak in the UK to consider the role of expert judgment in framing risk and uncertainty and to challenge the assumptions that healthcare could absorb a larger scale flu pandemic. The paper speaks to several research strands within STS but particularly, the role of expertise in decision making, the management of risk and uncertainty, and the processes around governance and policy making. Within this context, the importance of the management of scale is hjghlighted as a key policy problem. It involves the NHS as both a national, regional and local entity where the management of scale can be seen to have a political dynamic that is often overlooked. The paper is based on a period of ethnographic work within a government body charged with planning for extreme events and also includes the findings of interviews with policy makers and planners who have responsibility for dealing with such events. The paper highlights the need to frame policy making within a system of systems approach and, as a result, seeks to integrate work in STS with that carried out in systems ergonomics.

Session Organizers:

Matthias Wienroth, Policy, Ethics & Life Sciences Research Centre, Newcastle University
Jodyn Platt, University of Michigan Medical School

078. How Does Mobility Change Researchers, Research Groups And Scientific Communities? (III)
Papers for Open Panels/How does mobility change researchers, research groups and scientific communities?
Open Panel
4:00 to 5:30 pm
ICC: C2.6
Participants:

Transnational mobility of academic scientists and engineers: Do global boundaries matter for international collaboration? *Meghna Sabharwal, University of Texas at Dallas; Roli Varma*

With the advent of globalization and the rapid development of transportation and communication systems, scholars have focused their attention on transnational migration, which is a process by which immigrants forge and sustain simultaneous multi-stranded social relations that link together their societies of origin and settlement (Schiller, et al. 1995). The theory posits that the spaces migrants occupy are so widespread that collaboration, exchange of ideas and norms happen without having to cross physical borders (Levitt & Jaworsky 2007) i.e. an individual lives in more than one country simultaneously. Within the transnational framework, return migration does not signify an end in

itself; instead, a transnational perspective makes the concept fluid and continuous. Returnees are of great importance as their decision to return strengthens loyalty and a sense of nationalism in a global world. Making sense of the experiences of Indian return migrants serves as a powerful lens for understanding how these individuals redefine their relationships, particularly within the institutional, societal, and transnational context. In an increasingly connected world, return has individual ramifications as much as it has global considerations. The decision to return is mostly value driven rather than economic. This study will utilize in-depth interviews of academic scientists who after receiving their PhD in the US and working at least 5 years in the host country decided to return to India. Specifically, this study will add to the body of knowledge in the area of transnational migration of the highly skilled and the concept of fluid borders.

Asians differentiated: Tracing the career paths of mobile Asian and Asian American academics in the United States *Pei-Ying Chen, Indiana University - Bloomington*

The representation of racial and ethnic groups in science and engineering (S&E) education and employment is different from that in the U.S. population. While Asians account for only 6% of total population, they are overrepresented among S&E doctoral recipients and academic workforce, and are not considered minorities in higher education. Despite Asian Americans' higher levels of educational attainment on average, the vast majority of Asian faculty members are not born in the U.S., indicating that they may have a rather different education history than their White or Asian American colleagues. This highlights the problematic assumption of Asians as a homogenous ethnic group, disregarding diverse educational and cultural backgrounds. Moreover, the treatment of Asians the same as Whites in the higher education workforce is questionable, given the latter accounts for 78% of early career doctorate holders. Drawing data from the National Center for Science and Engineering Statistics (NCSES), the current study seeks to disentangle Asian academics, examining differences among those who have immigrated and those who were born in the US examining career paths, nature of employment, and types and prestige of employment institutions.

Finding balance in global relationships: roles of collaboration, mobility, and specialization in building ties across countries *Yi Bu*

We analyze the role of disciplinary specialization in constituting the scientific collaborative and mobility relationships between countries. The scientific relationship between two countries is composed of collaboration and mobility through co-authorships, co-affiliations, and migration. The Probability-Affinity Index (PAI) is a widely used measure of the strength of the relationship between countries, taking into account their relative sizes. Past research using the PAI has found that the degree of this relationship is influenced by geographic proximity (U.S.A and Canada), language similarity (Spain and Mexico), and historical relationships (Colonial ties; soviet nations). Along with these factors, the specialization of a nation's scientific workforce and funding priorities may also be relevant to the relative strength of the relationship. Such specialization may

result from historical priorities or unique geographic characteristics. We use data from the Web of Science to calculate the PAI of collaboration (co-authorship) and mobility (migration) between countries and by scientific discipline. Using this data, we discern the importance of specialization to forming international scientific relationships. We also identify three types of prevalent specialization-based partnerships: co-option pattern, where both countries are strong in a given discipline; solidarity pattern, where both countries are weak in a discipline; and master-pupil pattern, where fields are of contrasting strength. Disciplinary influences the scientific relationship between countries, alongside the host of other historical, linguistic, geographic, and cultural factors. Comparative analyses of the role of specialization between countries can be useful for informing immigration policies and motivating further collaboration and mobility relationships.

Many faces of mobility: a taxonomy of bibliometric mobility indicators *Rodrigo Costas, Centre for Science and Technology Studies Leiden U*

We present a methodological framework for developing scientific mobility indicators based on bibliometric data. Using an author name disambiguation algorithm we identify nearly 16 million disambiguated authors from all publications covered in the Web of Science in the 2008-2015 period. Based on the information provided in each bibliographic record and across individuals' publication record, we track international mobility of scientists and propose a classification of scientific mobility by which to analyze the phenomenon of scientific mobility. We distinguish between migrants and travelers based on the traces they leave. We find that 3.7% of researchers in our data set are mobile. Within these, travelers represent 72.7% of all mobile scholars. Still, migrants seem to consistently have higher scientific impact. We then apply the classification at the country level by further expanding these two classes based on the directionality of scientists movement (incoming and outgoing). Our findings point out as to the potentialities of our classification to further understand the effect of mobility in individuals, countries or fields, among others.

Moving on up: the relationship between international mobility and global leadership *Zaida Chinchilla-Rodríguez, Consejo Superior Investigaciones Científicas (CSIC), Instituto de Políticas y Bienes Públicos (IPP)*

As scientific collaboration and mobility benefit scientific careers of individual researches and scientific capacities of countries, changes over time-related to the productivity, research performance, and linkage capacities of researchers and countries can be detected. Authorship order provides critical information for the allocation of reward, and both collaboration and mobility enable researchers to expand the network of co-authors, institutions, and countries involved in the research. We hypothesize that both dimension of connectivity offer researchers the possibility to lead publications, as well as to expand the networks of co-authors and institutions with which they exchange knowledge. As bibliographic data embedded such important information about the changes in the position of authors in the byline of publications and the institutions involved in the research, we analyze these changes over time—using a disambiguated Web of Science dataset—to explore the extent to which

collaboration and mobility relationships impact leadership the scientific workforce.

Session Organizer:
Cassidy Sugimoto, Indiana University Bloomington
Chair:
Cassidy Sugimoto, Indiana University Bloomington

079. Air Pollution Governance: Sites, Styles, Histories
Papers for Open Panels/Air pollution governance: Histories, sites, styles
Open Panel
4:00 to 5:30 pm
ICC: E3.10

This panel brings together researchers focused on ways air pollution has been governed in different contexts. In keeping with recent sensibilities in the literature, this panel takes governance to include both state as well as a wide array of non-state actors, with a particular interest in understanding the various roles that techno-scientific communities across varied contexts play in governance processes. The panel therefore invites reflections on a broad range of topics: presentations can focus on different kinds of air pollution (indoor or outdoor), and on different scales of governance — for example, the development of national laws, urban planning initiatives, or citizen mobilization against a particular polluting facility. Presentations will also vary in where they focus on the source-to-impact continuum, possibly examining, for example, the thought styles of air pollution scientists, the public relations strategies of polluting corporations, or ways nurses come to understand and treat respiratory problems associated with air pollution. Other topics of interest include science-to-policy pathways, new data collection and visualization practices, air pollution education, and environmental injustice. The panel includes research and researchers based in settings around the world, helping advance TRANSnational STS by developing a nuanced and comparative understanding of governance styles across different historical and cultural settings.

Participants:
Air Pollution Governance in 6+ Cities *Aalok Khandekar, Indian Institute of Technology Hyderabad; Kim Fortun, University of California Irvine*

The Air Pollution Governance Across Cities Study (known as the 6+ Cities Study) works to characterize comparative insight and cross-city dialogue in identifying air pollution as the world's largest single environmental health risk. The 6+ Cities Study aims to characterize distinctive styles of environmental health and risk governance, at the city scale. Through interviews, observation of public events, and analysis of media, government, NGO and scientific reports, the study team is examining different stakeholder roles and perspectives, links between policy domains (especially environment, transportation, health, and education), and links across scale (urban, state, national, and international). Originally, there were six cities in the study, with research groups in each city (Beijing, Bangalore, Houston, Philadelphia, New York City, and Albany, funded by the US National Science Foundation). The study has now expanded to include four more Indian cities (Delhi, Hyderabad, Chennai and Pune, funded by the Azim Premji Foundation), and Los Angeles. Methodologically, the study models and advances capacity for multi-sited, internationally collaborative anthropological field research on education-to-science-to-policy pathways, which can be used to address a wide range of complex

societal problems. In this presentation, we'll describe how the 6+ City Study has developed, and what we have learned so far.

Breathing in Delhi's Peripheries *Rohit Negi, School of Human Ecology, Ambedkar University Delhi; Prerna Srigyan, Ambedkar University Delhi*

Delhi's environmental history cannot be understood outside the continuing peripheralisation of ecological risk. The city's hinterlands have not only been the identified sites for industries but also of waste and practices--from slaughterhouses to landfills--deemed 'out of place' in a modern, globalising city (Sharan, 2014). Our paper views these sites through an atmospheric lens, examining the relational production of space, vulnerability, and breathing in these zones of exaggerated risk. It further asks where the peripheries figure in the circuits of knowledge production via measurement and visualisation, and in the governance of air. Specifically, we consider the neighbourhood of Okhla to think through these matters by locating the changing nature of risk and mapping the everyday practices of residents. Here, a large and exhausted landfill, a modernist industrial area undergoing post-industrial change, a depot where thousands of trucks drop off containers from the larger region in transit via the railways every night, and a new waste-to-energy plant that deposits soot over buildings every night share space with dense housing, multiple health facilities, and remnant forests. Our interest in air and breathing in the peripheries adds richness to the scholarship on the intersections of environmental forms and urban experiences in neoliberal India.

The Invisible Infrastructures of the Smog. Technical Standardisation and Data Infrastructure in Air Pollution Measurement (the Case of Poland) *Michał Wróblewski, Nicolaus Copernicus University in Toruń, Poland*

High level of suspended particulates (PM10 and PM2,5) makes Polish air quality one of the worst in Europe. This is mainly related to the fact, that Polish individual energy consumption is based mainly on coal. Although the problem exists for quite long time now (since the 90s), it became a subject of public concern only recently. Citizens in big Polish cities started to pay more attention to air quality. Numbers of NGOs exclusively concerned with the problem (so-called Smog Alerts) have been created. NGOs not only direct the attention of policy makers, local politicians and public institution to poor air quality, but they also create alternative data infrastructure. This infrastructure consists on sensors and mobile applications (that makes the data easy to obtain by regular users). Recently the smog problem started to be the subject of private sector interest. Many companies sell simple sensors that can be used in home environment or create its own infrastructure and collect data in Polish cities. The latter are used by big web portals, that show information about air quality to millions of viewers every day. The question arises, what are the relations of different actors (public institutions, NGOs and private companies) involved with the air pollution controversy? To collect accurate and reliable data on suspended particulates it is necessary to calibrate measuring infrastructure and to standardize the way data will be indexed. On the level of technical standardisation and data infrastructure there are serious discrepancies between aforementioned stakeholders. Each one of them uses different sensors and

devices, adopts different legal norms, uses different analytical standards and different methods of data visualisation. It can cause many social consequences – e.g. private sector scales are simpler than those used by public institutions and makes its data more visually attractive, so their data has far more social range despite its lack of accuracy. In the paper I want to: 1) show the differences in the ways that data are collected and standardize by different stakeholders; 2) consider how those differences affect the possibilities of copperation between stakeholders. My research project is based on field research. The main part of the research are in-depth interviews conducted with representatives of inspectorates of environmental protection, NGOs and private sector.

The Role of Transboundary Air Pollution Research in the Making of the South Korean Regulatory Regime *Chuyoung Won, Seoul National University*

This paper aims to shed new light on the relationship between transnational scientific cooperation and national regulatory policy, based on a historical examination of the responses to transboundary air pollutants in South Korea from the mid-1980s to the 1990s. After the discovery of acid deposition traveling from China to adjacent countries during the mid-1980s, transboundary air pollution in East Asia has begun to an emerging global environmental issue. Since then, governments in East Asia have promoted transnational cooperation projects to monitor transboundary air pollutants. In this paper, I explore how common technical standards and measurement methods had been formed through such cooperative research initiatives, and how they became the "scientific" foundation of national regulatory policy on air pollutants. Specifically, I trace Korean scientists' activities in the Regional Air Pollution Information and Simulation Project (RAINS–Asia, 1992–1997), and then I examine its impact upon South Korea's national regulatory research project, the Development of Technology for the Monitoring and Prediction of Acid Rain (1993–1999). RAINS–Asia, the first transnational scientific research project on acid rain in Asia, sought to develop an atmospheric assessment model. South Korean scientists redesigned the assessment model to fit the local atmospheric conditions of Korea through the subsequent project. Including the modified assessment model in national regulatory policy, the South Korean government succeeded in expanding its monitoring network for transboundary air pollutants. Throughout this work, this paper will contribute to STS literature on transnational environmental governance and knowledge production.

Scientific Expertise And Public Action. Governing The Air Pollution Problem In Paris. *Justyna Barbara Moizard-Lanvin, École des Hautes Études en Sciences Sociales. Centre de recherche médecine, science, santé et sociét*

In the 1990s, following the French air pollution cohort study (PAARC), the air pollution, and in particular the industrial air pollution, no longer represents a public health issue. It calls into question the Air Quality Monitoring Association funding in Paris. The Regional Health Observatory epidemiologists are commissioned to confirm this hypothesis. In 1994, the first "time series" studies are published, illustrating short and medium term effects between exposition to low doses of air pollution and cardiorespiratory health, causing excess mortality. Scientific and institutional partnership, carried

out with epidemiologists on the international level and with other scientific circles (toxicologists, statisticians and metrologists), legitimized the epidemiologists approach. The new air pollution source is documented – transport, ignored so far for its environmental-health harmful effects. Today, despite a public accumulation of scientific knowledge, the associative mobilizations rise, the health agencies development and the significant growth of scientific expertise in the public policies development, the national public action is characterized by a certain degree of inaction leading to the long-term persistence of these problems. This study calls for attention to the recent phenomenon of a rise in environmental and health public action initiated by Paris as an addition to or substitution for national policies. Drawing on documentary analysis, interviews and observation of a Paris newborns cohort experts, this paper analyses the place of scientific, political and economic dynamics, and in particular the role of epidemiologists, that structured the definition and multiply attempts to set up public policies related to environmental-health problems in Paris.

The Challenge of Air Pollution Governance: The Case of Taiwan *Wen-Ling Tu, National Chengchi University*
Air pollution problems are extremely complex and controversial due to the different "scientific" rationales adopted by the various fields to explain the causes. To understand the air pollution problems, we need the following information/ knowledge generation: 1. pollutants from the source of the emissions, 2. diffusion path simulation, and 3. the affected and changing status of the receptor. However, there are still some intervals in connecting different parts of knowledge. As a result, it has become extremely challenging for the government to introduce effective solutions. This paper, through the perspectives of risk society, regulatory science and environmental governance, examines Taiwan's civic anti-air-pollution initiatives, which have been widely organized in central and southern Taiwan against industrial pollutions. The citizen mobilization has raised the risk perception of the society and contributes to the government's actions. This paper analyzes the certain and uncertain knowledge of air pollution that constructed by the civil society, and further discusses how those initiatives highlight the difficulties and limitations in clarifying and solving the uneven risk distribution problems of air pollution. By examining the different claims, arguments, and knowledge forms proposed by the numerous roles involved in the air pollution controversies, this paper will also reflect on the limits of the current scientific benchmarks or risk assessments. In conclusion, the paper highlight the important to incorporate STS perspective and social science-oriented methodology into air pollution prevention and control strategies.

Session Organizer:
Kim Fortun, University of California Irvine
Chair:
Aalok Khandekar, Indian Institute of Technology Hyderabad
Discussant:
Soraya Boudia, University Paris Descartes

080. Medicine and Gendered Bodies
Single Paper Submission
Open Panel

4:00 to 5:30 pm
ICC: E3.2
Participants:
Disfigured To 'Reconstructed Normal' Body: Acid Attacks Through The Lens Of Biosociality *Kanika Sharma, NA*
Acid attack is a gruesome violence which is increasing worldwide. But its predominance is seen in South Asian countries. Acid attacks are a consequence of jealousy, rejection and revenge. In India, most of the cases are reported citing rejection as the cause. According to the statistics by Acid Survivors Foundation India, 1189 cases were reported across Indian states from 2010 to 2016. These attacks result in the disfigured body causing disruption in the 'normalcy' of life practices. This disfigured body becomes the site for intervention and interrogation primarily from biomedical technology and then from the family, society, judiciary and the self. Acid attack survivors negotiate their identities from being victims to survivors as they go through the various surgeries and their relations with the outside. To survive the entanglements of power, patriarchy and normalisation, survivors resist by forming biosocial groups where their identity as collectives is formed. These negotiations lead to formation of groups and their network such as surgeons, non-governmental organizations, media, other families, bureaucrats, scientific enterprise and pharmaceutical companies. It is these contestations and conflicts along with the surgical procedures there is development of 'reconstructed normal'. The paper describes the experiences of the 'reconstructed normal' body through multiple sites using multi-sited ethnography by George E. Marcus. The malleability of the body is best described by the instances of acid attack, that is, acid which is a product of technological invention is the cause of this body and on the other hand, reconstructive surgery is the ultimate consequence.

Changes of Scientific Discourses and Feminism: Focusing on the Sex/Gender Differences Studies Using fMRI *Genie Yoo, Princeton University*
This paper aims to examine the changes of scientific discourses with special attention to the discourses on sex/gender differences in fMRI studies. As Codelia Fine's notion of 'Neurosexism' implies, gender stereotypes influence fMRI studies. However, focusing on discourses reveals that 'scientific facts about sex/gender differences' are created and interpreted by the influence of various discourses on the differences including gender stereotypes and feminist discourses. That is, various discourses influence cognition of researchers and these effects are reflected in their results, leading to different levels of discourses. This implies that discourse can be changed by interacting with various discourses even in the realm of science, which suggests that discourses based on 'value' such as feminist discourses can lead to positive changes of discourses.

Visualizing the Racialization of Testosterone in Biomedical Studies *Brandon Kramer*
Over the past 20 years, the testosterone replacement therapy industry has grown to a more than $2 billion global industry. While feminist science studies scholars do well to explain why aging men are the primary consumers of these drugs, few critically examine how durable preoccupations about race influence the ways that biomedical experts prescribe testosterone. In this project,

I use social network and content analysis to outline an ongoing controversy regarding how testosterone is implicated in prostate cancer. Although medical experts were trained for more than 75 years that higher levels of endogenous testosterone increase prostate cancer risk, an emerging group of researchers now claim that lower levels of testosterone exacerbate risk and that testosterone therapies may actually help treat prostate cancer for some patients. Still, the most widely used clinical guidelines for testosterone explicitly recommend against physicians prescribing these drugs to African American men because of their higher overall population risk of prostate cancer. To explore these contradictions, this work maps co-author and citation networks to outline how testosterone became racialized through the selective citation practices of a white nationalist hate group named the Pioneer Fund. Although claims about racial differences in testosterone are unsupported by most existing scientific evidence, the ideology that racial difference is biological still haunts the gold-standards of evidence-based medicine and thwarts access to testosterone for African American patients. This work contributes to science studies by showing how social network data visualization can help map controversies at the intersection of pharmaceuticalization and critical race studies.

Session Organizer:
Brandon Kramer
Chair:
Brandon Kramer

081. Lives in STS "as a Series of Failed Political Experiments"
Papers for Open Panels/Lives in STS "as a series of failed political experiments"
Open Panel
4:00 to 5:30 pm
ICC: E3.3

This open panel invites exploration of how to make sense of the biographical changes in changing contexts of radical scientists and of critics of science since the 1970s, as well as of STS interpreters of science influenced by them. Papers for the session can be viewed and comments posted at http://livesinsts.wordpress.com. The panel hopes to "encourage[e] looser attachments, greater irony and a sense of humour when undertaking these engagements," as Gary Werskey, following up the quote in the panel title, advocated when asked to reflect on transitions in his own life since his Visible College, a history of an earlier generation of radical scientists in the UK. The panel also hopes that contributions will apply back on STS itself Atsushi Akera's emphasis in Calculating a Natural World on STS "avoiding the determination of any layer of… the complexity [of changing contexts]; capturing the interpretative openness (as against hermeneutic closure) for actors; and conveying the contingency and indeterminate quality of changes and of failed initiatives…" Formation of new professions, Akera notes, "often occurred at the intersection of multiple institutions and disciplines," and involved "recombining prior knowledge and preexisting institutional forms," and various actors "letting go" of some commitments in order to forge new associations. Contributors are welcome to try to make sense of their own biographies in and around STS in relation to what Kelly Moore has described as the "proliferation [since the 1970s] of new institutions of deliberation, participation, activism, enterprise, and social movement mobilization."

Participants:
Making Visible A Collage Of Radical Scientists And Critics

Peter J. Taylor, UMass Boston
Asked to give "a presentation on the intertwined histories of Science and Technology Studies and Science for the People," I soon found myself exploring questions about how to make sense of radical scientists and critics of science in relation to their changing contexts. Themes that guided inquiry include: Transitions, Transversal, Tensions. Vignettes include: Werskey, Young, and Haraway. What emerged is resonant with Werskey "encouraging looser attachments, greater irony and a sense of humour when undertaking… engagements" in criticism of science and liberatory social change.

From radical scientist to STS intervener *Brian Martin, University Of Wollongong*
In the early 1970s in Sydney, I was part of a radical science discussion group. Later, in Canberra and Wollongong, I undertook various activities related to STS, including challenging establishment experts in the debate over nuclear power, writing critiques of science, documenting suppression of dissent in science, being involved in women-in-science groups, intervening in the debate over the origin of AIDS, spelling out strategies for dissenting scientists, critiquing STS, studying how technology can support nonviolent struggle, and supporting free speech for vaccine critics. These various activities can be related to my roles, initially as a scientist and later as an STS academic, and to circumstances and opportunities. For each type of activity, there are advantages and disadvantages. I plan to highlight the lessons I learned from different sorts of engagement.

Motivating Investment in Interdisciplinary Infrastructure: What Can One Person Do? *Michael O O'Rourke, Michigan State University*
In this talk, I will discuss how to gather resources, data, and good arguments for investing in inter/ transdisciplinary research, in its infrastructure, and in hiring and training capable staff. Although the perspective I adopt is rooted in my disciplinary training as a philosopher, it also reflects my longstanding interest in interdisciplinary pursuits. I will extract lessons through reflection on a number of inter/transdisciplinary projects that I have been involved in developing over the course of my career — a long running conference and associated book series, a well-established colloquium series, and an influential research and outreach project that focuses on communication and collaboration in cross-disciplinary research. I will describe these efforts, sharing details about successful and unsuccessful strategies for building interdisciplinary capacity in an academic institution. I will ground these details in the literature on institutional support for inter/transdisciplinary scholarship, as well as on the importance of accountability in evaluating complex scholarly efforts of this type. This presentation will provide information that can be used to effectively "make the case" within an institution for recognition, support, and validation of a career path that involves facilitating inter/transdisciplinary research.

Session Organizer:
Peter J. Taylor, UMass Boston
Chair:
Peter J. Taylor, UMass Boston

082. Not Global Health (?): Theorizing Biomedical Governance from the South

Closed Panels
Traditional (Closed) Panel
4:00 to 5:30 pm
ICC: E3.4
This panel explores various forms of biomedical intervention and governance "from the South". As biomedicine articulates with humanitarianism, diplomacy, biosecurity and the law, it is both productive of and shaped by forms of postcolonial and transnational governance. This speaks to a certain "global" health, which both operates within and potentially re-scripts financialized, neoliberal, Euro-American global health paradigms. How might we theorize biomedical governance out of these global Southern interactions? The papers in this panel ask this question, using empirical material from Cuba, South Africa and Vietnam. They thus contribute to debates on biopolitics and biocapital, while furthering a conceptualization of postcolonial STS.

Participants:

Against Humanitarianism: Cuba's Quest for Exporting Social Justice through Medicine *P. Sean Brotherton, University of Chicago*

What happens when a small, resource-poor nation such as Cuba becomes a leading figure in delivering "humanitarian biomedicine" to the world's underserved populations? For Cuban officials, the imperative to assist is not solely dictated by need, as defined by the Western humanitarian imperative, but a duty based on an intensely political commitment to equality and social justice. The country's tactical efforts to mobilize biomedical expertise, as a war on structural violence, unsettles traditional geopolitical understandings of donor-recipient relations and challenges well-established capital flows from the global North to the South. But, the question remains: Is there, conceptually and philosophically, another rationality that is at work here? With an eye to rethinking the logic and practice of global health, this paper examines Cuba's explicitly politicized variant of humanitarian biomedicine to trace the emergence of the constellation of "health" and "global" as starting points rather than taken for granted analytics. Specifically, I tackle the underlying epistemological issues of health interventions, or what I call the "logic of intervention." I lay out the groundwork for considering how Cuba's quest for global health justice offers a counterpoint to, what Tobias Rees (2014) terms, the dominant "global biological humanity project." The latter term defines the global shift in interventions from a public, social welfare model to a privatized, market-based concept of health care. I then explore the practices of contemporary global health, as a mobile technology of power—and resistance to this—in Africa and Latin America. Cuban physicians laboring in aid programs throughout the Americas are improvising and thereby reworking biomedical practices to meet both local and global demands. I analyze what iterations of this approach to "health," as a target of intervention, is part and parcel of this humanitarian mobile technology.

Cuba-Vietnam Medical Diplomacy and the Articulation of a (Post)Socialist Biomedical Network *Natalie Hannah Porter, University of Notre Dame*

Last spring, government delegates from Cuba and Vietnam signed agreements to send Cuban health professionals on years long missions to Hanoi in order to share expertise in high-tech medical genetics and oncology. Along with the development of joint-ventures to advance pharmaceutical production and cooperation, these agreements comprise the most recent chapter in a long history of medical diplomacy and exchange between the two nations. Symbolized by the Cuba-Vietnam Dong Hoi Friendship Hospital (est. 1981), such exchanges have been animated by an effort to build sociotechnical capacities to address the unique health burdens accompanying revolution, socialist transition, and, more recently, economic adjustments. In this paper, I posit Cuba-Vietnam medical diplomacy as a critical site for the development of a global, (post)socialist medical network. I pose a set of potential methods for charting this network, and for considering how Cuba and Vietnam's interwoven, yet distinct political-economic trajectories have shaped the provision of health care, as well as the subjectivities of health diplomats and scientists in both nations.

Infection, compensation, containment and justice: biosecurity and value in the 2017 avian flu outbreak in Cape Town, South Africa *Thomas Cousins, University of Oxford; Michelle Pentecost, Kings College London*

In late 2017, a highly-pathogenic avian influenza (H5N8) outbreak swept across southern Africa, devastating in particular the poultry industry in the Western Cape and affecting supplies and prices of eggs and meat in the city of Cape Town. More than three million birds died or were culled nationally, and state vet services in the Western Cape struggled to contain the outbreak, as chicken died more quickly than could be culled. Wild populations of swift terns have emerged as a possible vector that continues to threaten the poultry industry, but more significantly, state vet services are beginning to understand the vital articulations between medium-sized layer operations (largely white-owned) and informal (township) economies of disposing of laying hens when they become unprofitable. In the translation of industrial laying poultry into imileqwa (tough, wiry, tasty, rural chickens at the heart of Black African urban consumption of protein) that came into sharp focus in the slippage around what constituted "culling" lies a complex economy of containment and compensation. The handling of the outbreak has amplified intense public debates about claims to justice, state provision, and redistribution in the context of a crisis of a deepening drought that might devastate the city in 2018/2019. Poultry farmers reluctant to cull wanted compensation from the state; state vets wanted to limit the re-sale of chickens into informal markets in order to limit potential zoonotic infection; informal re-sellers suddenly lost all revenue, the price of eggs shot up, and the search for imileqwa suddenly went (inter)national. In this paper, we present a thick ethnographic account of the state response to the outbreak, tracing the course of the outbreak and the technologies deployed by veterinarians, health officials, politicians, and ordinary citizens, in order to consider how ideas about enforcement, containment, compensation, and value are mediated and translated across forms of life and death. … In contrast to the biosecurity complex much described elsewhere (Keck 2015, Lakoff, etc), our case illustrates how the biopolitics of bird flu in this postcolonial urban setting elicits ambivalent concerns about security and readiness, the value of life and the place of animals in the city. Examining how pathogens, species, and populations come together across unstable lines of transmission, infection, and consumption, we

argue that informal economies and local institutional arrangements are important factors that shape local technologies of biosecurity and preparedness.

The breather as patient and plaintiff: biopolitics, labor and the judicialization of tuberculosis *Kaushik Sunder Rajan, University of Chicago*

My paper will think through certain aspects of the judicialization of health in South Africa. The "judicialization of health", as conceptually developed by Joao Biehl and Adriana Petryna, speaks to ways in which demands concerning health have been made through the law, especially in global Southern contexts. I consider two seminal South African cases concerning the judicialization of tuberculosis, one relating to prisons and the other to mines. I show how judicial interventions in such cases are animated by creative interpretations of foundational constitutional principles, and thus speak to universalizing imaginaries of human rights that are intimately connected to postcolonial imaginaries of post-apartheid democracy. At the same time, they are forced to respond to the specific histories and presents of carceral and extractive regimes of neoliberal governance. I will think with Tim Choy's notion of the "breather" to consider the differentiated biomedical and political subjectivities of tubercular patients who are also prisoners or mineworkers, who make claims for compensation through the courts on the basis that their disease was caused by the conditions of their labor and/on confinement. In what ways do these political claims articulate with, enable or constrain the South African constitutional imagination of health as a human right? Can biomedicalized and constitutionally mediated legal action envisage new modalities of collective struggle?

Fashioning the Hemorrhagic Body: Ebola in Western Africa in 2014 *Stephen Wallace, (unspecified)*

Ulrich Beck finally urged us to reconsider the future in terms of both 'goods' and 'bads'. While health has become an almost untrammeled 'good' in the modern western world, disease still embodies a 'bad' whose demise may represent the ultimate triumph of modern western medical power. The recent outbreak of Ebola viri presents an ideal case study for the clotting of a new corporate body, fashioned by many corporate players including the military, the academy, big pharma, and the citizens of Western Africa. If modern disease has rapidly proliferated and circulated outside the sick bed and the research laboratory, into the clinical pharmacies, media channels and military barracks, this story may be exemplary in its size, scope and speed; not to mention its gravitas and globality. While the fight against 'Ebola' has been largely represented as an exemplar of global collaboration, especially between the diverse interests and stakeholders of disease, I argue that it also may be seen as the latest 'innovative' embodiment of the dystopian enterprises of power, money, force and plague. This new corporate body, established in 2010, enrolled the Scripps Research Institute, AutoImmune Technolgies LLC , Corgenix Medical Corporation, together with various academies and military interests, into a center of calculation based at the Kenema Government Hospital in Sierra Leone, to produce a new variant (2) Makona EBV in 2014, which superseded the CDC's 2007 patent of Bundibugyo EBV.

Session Organizer:

Kaushik Sunder Rajan, University of Chicago
Discussant:
Kristin Ann Peterson, UC Irvine

083. Quantified Patients and Physicians
Papers for Open Panels/Critical Digital Health Studies
Open Panel
4:00 to 5:30 pm
ICC: E3.5
Participants:

Advancing to the next level: the quantified professional-self and the gamification of physicians and scientists *Iris Wallenburg, institute for Health Policy and Management; Björn Hammarfelt, University of Borås; Sarah de Rijcke, Centre for Science and Technology Studies (CWTS); Roland Bal, Erasmus university rotterdam*

The digitization of healthcare does not only affect patients, but also healthcare practitioners whose performance are increasingly being measured and, subsequently, displayed in graphs, flow charts and bench-marks (e.g. number of post-surgical infections, scores on teaching competences). These measurements and visualizations have much in common with digital devices used for self-monitoring of health, work and leisure (Lupton 2016; Ruckenstein and Pantzar 2015). Next to imposed quantification practices, physicians themselves employ digitization and quantification practices like using Twitter and Facebook to build heterogeneous networks of patients, fellow-clinicians and klout scores to expand networks, display individual performance, evoke new ways of care giving, and compete on popularity. Similar patterns are seen in science, where measures of scholarly impact based on online activity (e.g. ResearchGate) are used to study and assess the impact of research–constituting the quantified academic-self. In this paper, we use Johan Huizinga's notion of play (Huizinga 1955) and Peter Sloterdijk's concept of self-betterment (Sloterdijk 2014) to explore how physicians and scientists alike enact digital technologies as liberating instruments and taking control over one's own (self)evaluation and self-presentation as a way of gamification (Hammarfelt et al. 2016). The paper is based on a comparative analysis of several projects in healthcare and academic practices focusing on the (numerical) evaluation of professional work in which we have focused on how quantifying practices are used by professionals in order to perform identity and care/research work.

From Self-Tracking to Tracking Patients? QS and health organizations in France *Eric Dagiral, Paris Descartes University, CERLIS*

In recent years, in order to improve their efficiency, health organizations in France have been striving to take advantage of innovations stemming from the so-called "Quantified Self" movement (Lupton 2016; Nafus 2016), notably by integrating digital self-tracking technologies into their day-to-day operations. We have been exploring the implementation of a "Smart Flat" experiment in which patients vitals and bodies are monitored and "quantified" through invisible sensors located in their rooms' environment. A second site of investigation consists of a "smart cigarette" project which relies on the interactions between smokers and 'watchers' mediated by digital data and notifications generated by the device, in conjunction with another hospital service. Our contribution aims at

showing how tools initially designed from the perspective of individual use are geared towards institutional contexts, and with what effects on actors, technological devices and agencies. We suggest that the original QS' voluntary self-measurement practices are caught up in a tension between experimentation and enforcement within a hospital institution. When the commitment to use is no longer left to individuals, this management is often seen as a form of "nudge", in keeping with recent neo-liberal perspectives of flexible prescribing of action (Thaler & Sunstein, 2009). Comparing these two fields, we discuss this essential tension between flexible guidance and prescription, and how forms of criticism, rejection and negociated appropriation happen. We conclude that critical claims towards those institutional data monitoring practices point towards the impossibility of reflexivity that they entail.

Future of General Practitioners in the Era of Quantified Self *Daniela Cerqui, Unil; Daniel Widmer, European Commission*

Dr Daniel Widmer is respresentative of the European Union of general practitioners/ family physicians (UEMO) within the healthcare professionals stakeholders group at the Health Technology Assessment (HTA) network of the European Commission. He works as a GP in Lausanne, Switzerland Dr Daniela Cerqui is a cultural anthropologist interested in the relationship between body, technology and society. She works as a senior lecturer and researcher at the Universtity of Lausanne, Switzerland. Our common interest is related to the future of medicine and to the relationship between patients and physicians in the era of digital health. Considering that GP are closer than other physicians to their patient's lived experience, we are working on the assumption that in the era of the quantified self, GP either are in charge of providing a meaning to numbers or to vanish in the network ocean… Our paper is based on focus groups we have held during the 2017 11th Family Physicians Conference in Paris. We have discussed four topics, defined according with Dr Cerqui previous researches focused on humans beings replaced by machines vs human beings enhanced by machines: - Evolution of the profession with preventive and decisional algorithms (i.e. GP replaced by technology?) - Diagnosis based on cerebral imaging replacing clinical phenomenology (i.e patient replaced by numbers?) - The augmented GP and modification of clinical competencies (i.e. enhanced GP?) - The use of biological sensors (i.e. enhanced patient?) We will discuss the results of these focus groups.

Life Drawing the Metrics of Care: Investigations of Data and Reproductive Health *Alexandra Jonsson, Westminster University*

This paper draws on my PhD research Body Politics of Data, a practice-based study of how big data re-positions the body as a site of both value production and financial rationalisation. It addresses the increasing use of 'intelligent products' in UK healthcare, focusing on predictive costing models and data driven decision making in reproductive health. I explore how a body is 'seen' through a costing database, and in turn how the calculations of bodies according to geographical location, behaviours, and age etc. are used. Looking beyond representation of datasets the research queries their usages and potential biases. The paper will discuss how

collaborative and reflexive practice-based methodology enables multiple agents such as midwives, expecting mothers and healthcare-activists to engage with the research through artworks such as 'The National Catalogue for Savings Opportunities' (created with Loes Bogers, 2017), a hand drawn catalogue for the maternity ward, where women can look up what part of their body has the greatest cost saving potential according to their borough. The drawings are created using 'savings data' reports issued by the government to maternity wards across the UK, and as such make visible what kinds of reproductive bodies become the target of financial rationalisation through predictive modelling of healthcare costs. The paper contributes with new critical practice-based approaches to feminist STS, and explores how research outcomes can become available to the wider publics through artistic works. The research raises question of sociotechnical biases, consent and shifting body boundaries in an age, where decision making is increasingly influenced by digital artefacts.

Between Care and Control *Robyn Schimmer, Department of Informatics, Umeå university; Karin Danielsson, Department of Informatics, Umeå university*

This paper deals with the consequences of bringing technologies that promote control into healthcare by questioning the characteristics of these technologies in relation to person-centered care models. Digital health today includes a large variety of technologies, many with the potential to change the very foundations of healthcare. Devices and systems for self-monitoring, data collection and analysis through AI and big data are examples these technologies. Besides the trend of more digital technology there is also a growing interest for more person- and patient-centered care models. These models often draw on holistic approaches that reaches beyond the biomedical understanding of the body. This movement can be seen as going beyond the biomedical paradigm where subjective matters often are neglected in favor of objective measurements (Ashcroft and Van Katwyk, 2016). However, what the emerging technology in the context offers is often more associated to measuring and monitoring the body, less on the person (Rapp and Tirassa, 2017). We argue that this reflects a transition and change of focus towards control rather than care, and thereby challenge person- and patient centered care models. Vicky Singleton (2010) gives an thoughtful parallel to this transition where the new technology of control comes in conflict with the traditional care for animals when implementing digital tracking systems for cattle. Could be moving in a similar direction? That is, transitioning care into a matter of monitoring and controlling bodies (obscuring the self). Or, can we find a balance between care (accounting for a compositional self (Rapp and Tirassa, 2017)) and control? Ashcroft, R., Van Katwyk, T., 2016. An Examination of the Biomedical Paradigm: A View of Social Work. Soc. Work Public Health 31, 140-152. https://doi.org/10.1080/19371918.2015.1087918 Rapp, A., Tirassa, M., 2017. Know Thyself: A Theory of the Self for Personal Informatics. Human-Computer Interact. 0, null. https://doi.org/10.1080/07370024.2017.1285704 Singleton, V., 2010. Good farming: control or care?, in: Mol, A., Moser, I., Pols, J. (Eds.), Care in Practice: On Tinkering in Clinics, Homes and Farms. Transcript-

Verlag, Bielefeld, p. 326.

Session Organizer:
Deborah Lupton, University of Canberra
Chair:
Deborah Lupton, University of Canberra

084. Science and Technology Studies and Science Education: 'High' vs. 'Low' Church Tensions (B)

Papers for Open Panels/Science and Technology Studies and Science Education: 'High' vs. 'Low' Church Tensions
Open Panel
4:00 to 5:30 pm
ICC: E3.6

Scholars and others have long encouraged infusion of research from science and technology studies (STS) into school science. Since at least the mid 19th century, for instance, educators like Spencer (1861) have recommended that science knowledge be learned through science inquiry activities informed by references to history, philosophy and sociology of science. Nevertheless, science education systems have tended to emphasize instruction in widely-accepted knowledge claims of the sciences and, associated with that, idealized conceptions of these fields. Struggles with authenticity of representation in science education (e.g. of phenomena, the social world, and ontological and epistemic groundings) seem to mirror STS publications (Breyman et al. 2017) – which have noted tensions between so-called 'High Church' and 'Low Church' STS (Fuller, 1993), the former emphasizing academic studies to represent the nature of science and technology while the latter prioritizing studies reforming these fields in ways benefiting societies and environments. Such tensions seem evident in, for example, nature-of-science education approaches – along with many 'STEM' (Science, Technology, Engineering & Mathematics) education initiatives – that avoid problems associated with capitalist influences on scientists and engineers and socioscientific issues education that prioritize students' reasoned personal choices about controversies over actions they might take to engage global crises (locally and globally). 'Low church' approaches might also be said to value minoritized, rhizomatic flights away from staunch universalist, dominating understandings of science and phenomena. Papers in this Panel will, accordingly, address 'High-Low Church' tensions from a diversity of perspectives as they pertain to STS infusion in science education.

Participants:

Being Scientific Mode of Education at the verge of STS and Science Education *Ramjit Kumar, Indian Institute of Technology Patna*

Collective pattern of thought acts as a resistance to the environment and inertia to social changes in Indian context. A Durkheimian scholar might explain that socio-religious thought and rituals enable the faithful to escape the limitations of their material conditions while a Mannheim might explain that it enable people to project their collective consciousness as the framework of policy decisions. In both cases it is clear that individual embraces the thought process that is not of their making but the products of societal transactions. Individual, is instead of making their own destiny is the product of society. Are such organized resistance or what can be called primitive instinct is to be valorized or pathologized? Or, are they vocation in any sense of the term? According to Steve Fuller, Sociology of knowledge does not have one answer to such question and finds itself unable to answer. This point has been resurfaced in Peter & Luckmann The Social Construction of Reality (1967) which mixes the two traditions of question. Modern social sciences have tried to solve this puzzle using social actor theory. According to Vilfredo Pareto, rationality in itself is self-explanatory without succumbing to dualism of ends and mean. Such division of opinion is also seen in philosophy of science. Hans Reichenbach and Larry Lauden divided such question to fall between epistemology of knowledge and sociology of knowledge. However, both agree that science favors the rational side of the debate and there is little need of sociological treatment. Taking cue from STS, this paper explores whether science education help to answer such questions? As science claims to be a unified body of rational claims and rationality, as Robert Merton in discussed institutional imperatives of science in his book. However, this view has been challenged on the ground that these are ideology rather than pre-requisites of doing science, and the very fact science makes itself immune to criticism on the claim that scientists are only accountable for things that they do on research sites and they are not responsible for any sort of consequences both intended and unintended. This sort of arguments falls on the boundary line of STS and Science education to ponder questions like - Whom do we see as scientists? Do we see scientist as a person who on the one hand engage in hard core laboratory equipment, on the other hand exercise discretion that is antithesis to science like visiting temples, believing in horoscopes etc.? Are scientists prone to same kind of scrutiny that we do engage with politicians? Do they have same binding to act in public life as doctors have through Hippocratic Oath? Or, such questions fall out of purview of domain of science merely reducing it to private realm? To answering such question one has to take in to account the character and nature of science in larger context of science in which it operates. Taking such empirical challenge into stride and also leaf from democratic claim within STS community this paper claims that there is need to unmasking the pretensions of elite scientists and break what Gaston Bachelard has called 'epistemological ceiling' to transform individual from having mode of operating science to being mode of science. For this, paper critiquing the concept of science capital produces new theoretical schema called 'science field' and tests the sub-construct of it like 'being of science', 'doing of science' against other sub construct called 'having science' of selected what national children science council calls 'young scientist'. Finally, it makes argument to inclusion of teaching of epistemic knowledge of science in science curriculum to call upon student to internalize self-reflexivity, critical consciousness and become scientifically literate by 'being of science' and not by mainly by 'having science'.

On the Legitimacy of Sociology in Engineering Studies *Li Sanhu, Guanzhou Academy of Governance*

This paper tries to apply STS methods, especially the sociological methods to engineering studies. The sociology of engineering as a new discipline is emerging in China, in which the most typical method is to take engineering as a kind of social activity, and then use the concept of community to investigate the social interactions among engineers, worker, investors, managers and other stakeholders. However, engineering is a complex phenomenon, and involves not only human but

also objects. Like the sociology of science, the sociology of engineering has to face the legitimacy problem of sociology in engineering studies. Around the legitimacy problem, I believe that engineering is a mode of collective material existence of human being, which means that engineering artifacts are Latourian "mediators" between social structure and individual agency. For the "mediators", it is to say that engineering is socially constructed rather than entirely applying science and technology. As it involves so many relationships between human and nature, and man and society, the sociological study of engineering have to fully take Mils' "imagination of sociology" as to master the widespread effects of engineering on society. Among these effects, the non-functionally social problems of engineering have been widely concerned by sociologists. I may identify so many social problems of engineering by the theoretical paradigms from the sociology of social problems, but considering the actual situation of different engineering fields, we need to understand the externally social problems and then recognize the complicated process of social construction of engineering based on the project scale and its sensitivity on ecological environment and human health. From above arguments, the sociological methodology of engineering studies is an extended one of STS(trans-nations). In one word, discussing the legitimacy problem of sociology in engineering studies is in my favor to establish its subject position in sociology, and to promote its sociological study targeting the engineering practice. That it is to say that the paper is extending STS as method to engineering studies.

Tensions and possibilities for an 'engaged' STS programme in science education *John Bencze, Ontario Institute for Studies in Education, University of Toronto*

Scholars have long advocated science education that is well-informed by science and technology studies (STS). In doing so, however, educators have choices to make regarding particular ontological, epistemological and axiological orientations of STS practices. Although there are, of course, many kinds of analyses of STS, Fuller's (1993) broad categorization into "High Church" and "Low Church" paradigms seems to be a useful starting point. The former category may be considered to involve scholarly analyses of characteristics of STS, akin to stereotypical conceptions of 'science' as efforts to know the world as it exists. Low Church STS, meanwhile, is more like traditional notions of 'technology,' aiming to change that which exists - presumably for the better. Although it is apparent that STS fields originated with Low Church emphases resulting from awareness of risks linked to science and technology (Breyman et al., 2017), science education has, generally, erred towards High Church orientations. This seems particularly evident throughout the 'neoliberal era' and perhaps even more extreme in recent Right-wing Populist contexts (Jilani, 2017). Students are frequently urged, for instance, to develop highly logical personal positions about potential social and/or environmental harms linked to science and technology that are portrayed as controversial - and, therefore, perhaps doubtful. Given power of pro-capitalist networks that often prioritize profit concentration and cost externalities, however, it seems clear science education must promote coordinated community-based critiques of and actions to address such socio-technical harms.

Nevertheless, such more Low-Church pedagogical orientations may need to be strategically-balanced with deep High-Church considerations (Sismondo, 2008).

Session Organizer:

John Bencze, Ontario Institute for Studies in Education, University of Toronto

085. What are the Relationships between STS and Empirical Ethics? A Panel Discussion on Neuroethics
Closed Panels
Traditional (Closed) Panel
4:00 to 5:30 pm
ICC: E3.8

Ethics and social science have a shared history and origin. Many pioneering figures in disciplines like economics, political science, and sociology (e.g., Bentham, Mill, Smith, Durkheim, Weber) had much to say about philosophical and ethical aspects of economic activity, society, and politics. However, with time, these disciplines have specialized such that the connections to more philosophical questions have become less apparent and, in return, philosophical ethics has tended to ignore scholarship emerging from relevant social science research. This disconnect is clearly apparent in modern discussions about "empirical ethics" and "empirical bioethics", sometimes described as the "empirical turn" in bioethics and the ethics of science and technology. Scholars active in this area are revisiting the relationships between ethics, as a more normative discipline, and the social sciences. However, there are fundamental theoretical, methodological, and practical questions surfacing about the relationship between social studies of science and the ethics of science. Neuroethics (or the ethical study of neuroscience) is a nascent field that has embraced the empirical turn in a way that attempts to bridge the divide between the social and ethical studies of science. This panel will explore some of the key theoretical, methodological, and practical questions about the relationship between social studies of science and the ethics of science. These developments have important implications for how STS scholars and philosopher/ethicists may be able to work together to tackle questions pertinent to both fields, and highlight potential challenges.

Participants:

A practical and ethical analysis of incorporating patient preferences into dementia research policy and practice *Cynthia Forlini, University of Sydney*

The World Health Organization has declared dementia a public health priority. The process of aligning the research agenda with this priority has elicited significant challenges in studying the prevention, detection, and treatment of dementia. For example, emerging technologies such as speech tracking through smartphone apps are being investigated as tools to detect cognitive decline. However, studies are limited by ethical and legal concerns for adequate consent and privacy, often hindering recruitment of key research participants with moderate to severe cognitive impairment. Overall, these challenges may be preventing valuable translational research that would benefit the health, care and quality of life of dementia patients and their caregivers. Robust justification to support whether and how the policies and practices that govern dementia research should be changed remains elusive. This paper addresses the perennial question in the ethics of science of whether descriptive data from the social studies of science can provide an ethical impetus for what ought to be done. Empirical evidence about the preferences of dementia

patients is reviewed to address the most ethically challenging issues in dementia research: (1) motives for research participation, (2) informed consent, (3) recruitment, (4) potential risks, and (5) data sharing. Patient preferences are then situated in the context of current research ethics policies to demonstrate how their implementation might create opportunities for dementia research or pose collateral practical and ethical challenges. This analysis initiates a dialogue about options for reforming dementia research and continues the debate on the normative nature of patient engagement activities.

A Technological Fix? Patient-testimonies of neurostimulation on YouTube *John Grant Gardner, Monash University, Australia; Narelle Warren, Monash University; Courtney Addison, Victoria University of Wellington*

YouTube has become a powerful and accessible medium of communication, and it is increasingly used by people to share their experiences of healthcare. In this presentation, we contribute to STS work on the performative role of expectations and hype in healthcare by investigating YouTube patient testimonies of deep brain stimulation (DBS). Specifically, we report on an on-going study involving the analysis of over 60 YouTube clips produced by people (vloggers) who are receiving DBS for the treatment of Parkinson's disease. In order to investigate the possible role of these YouTube clips in fostering unrealistic expectations among potential patients, we explore how vloggers delineate the DBS intervention, how they present their neurological illness, and how they present themselves. We argue that these clips display common compositional elements that may have powerful, persuasive effects on audiences. These include: the use of dramatic 'before & after' and 'on/off' video footage; framing that elides the relationality of selfhood and care; and the display of affective corporeal moments. Overall, we argue, this corpus of self-made patient testimonies appears to perpetuate an ideology of technological solutionism, in which DBS is presented as a 'fix' for clearly delineable neurological problems. This obscures the complex impact of both the neurological illness and the DBS intervention on the individual and their family. We reflect on how social science studies such as this can guide the ethical, responsible implementation of promising but complex biomedical interventions.

An empirical study of the ethical and policy implications of promoting a food addiction understanding of overweight and obesity *Adrian Carter, Monash University*

There is a growing view that the increasing prevalence and intractability of obesity is due to a food addiction. This view is supported by neuroscientific evidence demonstrating changes in the brain produced by the chronic consumption of hyperpalatable foods (e.g. refined sugars and fats), similar to those seen in drug addiction. This view is not without its critics. However, we have shown that there is enormous public support for food addiction explanations of overweight and obesity, particularly amongst those who are overweight. Proponents argue that regarding obesity as a "food addiction" will improve obesity treatment, reduce weight-based stigma and discrimination, and increase public support for public health policies to reduce overconsumption, such as the hugely unpopular sugar tax. However, promoting obesity as a "brain disease" or "food

addiction" could impair individual's belief in their ability to control their weight or seek treatment. It may also focus attention on medical solutions at the expense of more broadly effective social policies for reducing weight and improving health. There is little research examining the impact of food addiction messages on weight-stigma and discrimination, eating and weight, or support for public health policies to reduce overconsumption. Brain disease explanations of obesity may actually increase stigma, paradoxically increasing weight. This paper will review a range of social science methods, including qualitative interviews, quantitative surveys and behavioural manipulations to demonstrate how empirical approaches may inform health promotion, public health policy and the development of clinically useful messages about appetite and the brain in weight management.

Deflating the "Neurostimulation causes personality changes" bubble *Frederic Gilbert, University of Washington & University of Tasmania; John Viana, University of Tasmania; Christian Ineichen, University of Zurich*

The idea that deep brain stimulation (DBS) induces changes to personality, identity, agency, authenticity, autonomy and self (PIAAAS) is so deeply entrenched within neuroethics discourses that it has become an unchallenged narrative. Using analytical and methodological tools from STS, we conducted a literature review of more than 1,535 articles to investigate the prevalence of scientific evidence regarding these potential DBS-induced changes. While we observed an increase in the number of publications in theoretical neuroethics, we found a critical lack of primary empirical studies corroborating potential DBS-induced effects on patients' postoperative PIAAAS. Our findings strongly suggest that the theoretical neuroethics debate on putative effects of DBS relies on a very limited empirical evidence base. This finding indicates that the theoretical neuroethics may rely on unsubstantiated speculative assumptions in lieu of robust evidence; reflecting the likelihood of a speculative ethics bubble that needs to be deflated. Ethics engaged in un-evidenced and un-founded speculation may perpetuate and propagate misleading assumptions; as well encourage the public, but most importantly prospective patients, to adopt a reluctant approach to the treatment. Nevertheless, despite the low number of first-hand primary studies and large number of marginal and single case reports, potential postoperative DBS changes experienced by patients remain a critical ethical concern. We recommend further usage of STS instruments to enhance empirical neuroethics debate on potential postoperative variations of PIAAAS.

Session Organizer:
Eric Racine, Institut De Recherches Cliniques De Montréal
Discussant:
Stacy Carter, University of Wollongong

086. Show me the money! Science and Technology in the Age of Mega-Philanthropy
Papers for Open Panels/Show me the money! Science and Technology in the Age of Mega-Philanthropy
Open Panel
4:00 to 5:30 pm
ICC: E5.1
The funding of science and technology has been a research interest in STS for a long time. Its relevance does not only reside in the

influence that it has on the organization of scientific and technological activities but also, and more importantly, in the research agendas of groups, institutions and countries. In a nutshell, funding seems to direct where science and technology aim at. In the last years, however, a phenomenon emerged that may be the cause of profound transformations of the flow of resources for science and technology: the consolidation of mega-philanthropic organizations that challenge (or merge with) government S&T policies. From the Bill and Melinda Gates Foundation to the Chan Zuckerberg Initiative, the new billionaires who are replacing an old generation of philanthropists (e.g. Rockefeller, Carnegie, Ford) have devoted billions of dollars to influence the directions of scientific and technological investigation during their lifetime. They have argued that poverty, diseases, global climate change and gender inequality, among many other urgent problems, are challenges that should be faced and can be solved in an over-optimistic approach with important political and epistemic implications. In this panel, we want to discuss some of the consequences of the involvement of these organizations: new agendas, new theories, new ways of producing knowledge (e.g. practices of internationalization and transdisciplinary research), new institutional articulations, and new means to diffuse the knowledge produced and engage stakeholders. We invite papers that bring a critical review and insightful perspectives on these issues, as well as those focused on public policy and ethical implications.

Participants:

Conservation science and ecophilanthropy in the Iberá Wildlife Reintroduction Program *Emiliano Martin Valdez, CONICET / Centro de Ciencia, Tecnología y Sociedad Universidad Maimonides*

In the last decades, the American philanthropists Douglas and Kristine Tompkins have become the main financiers of conservation efforts and protected areas in Argentina and Chile. Through land donations and the allocation of financial and expert resources, the private operating foundation The Conservation Land Trust (CLT), founded by the Tompkins, has promoted the establishment of several National Parks and conservation programs in Argentina and Chile. In this paper, I focus on CLT's initiative to create what will be the largest protected area in Argentina: The Iberá National Park. In particular, I examine the Iberá Wildlife Reintroduction Program, which represents the first case of rewilding in a southern country. The aim of this program is to reverse the local extinction of species and produce socio-economic changes through ecotourism in the Iberá area. By focusing on the relationships between scientists, state agencies and private capital, I analyze how this conservation program enables the valorization of nature and the reproduction of capital in places where business opportunities did not exist until recently. Ultimately, I aim to shed light on how species are conceptualized as value, and how value is appropriated and distributed through bioeconomic projects.

Identifying patterns in research funding of influential philanthropies: insights from funding acknowledgement data *ElHassan ElSabry, National Graduate Institute for Policy Studies*

The decline of public research funding worldwide has forced a large number of universities to seek alternative sources of income to maintain their "competitiveness". This materialized in a plethora of university-industry collaboration arrangements as well as a whole ecosystem of university fundraising activities. A main player in this new ecosystem is philanthropic foundations. While their impact is still dwarfed by government and business funding, two issues are worthy of investigation; first, the extent to which the proportion of research funded by these foundations is increasing, and second, whether or not they predominantly fund certain fields or certain universities. This paper focuses on a group of six foundations that make up the core of the Science Philanthropy Alliance (SPA). SPA was established in 2015 with the aim of "substantially increasing philanthropic support for basic research" in response to government's shift to supporting translational research. The rationale is that "private funding is more patient and more nimble than government funding". Publications funded by those six foundations will be extracted from the Web of Science database and analyzed to identify patterns in four parameters, namely the amount of projects funded, research fields, affiliations of funded authors and characteristics of joint funding if any. Outcomes will be cross checked with information available on the foundations websites. Investigating research funding by philanthropies is a relatively new undertaking whether in the field of STS or in Science Policy. This paper aims to provide insights from the available data that more critical studies can build on later.

'If GoFundMe were a non-profit, we would be the fourth-largest in the world': The Big Business of Crowdfunding and the Ethical Implications of (Micro) Mega-Philanthropy *Matthew Wade*

Crowdfunding for personal medical expenses (CPME) has grown exponentially, now constituting a multi-$B industry powered by Silicon Valley start-ups, venture capital, and social media affordances. Historically, US-based philanthropy has fostered notions that petitioning for aid requires not just demonstrating need, but also moral worthiness. This also shapes the governance of health care, oscillating between free market principles v. ethical obligations of state to citizenry. Pushed to extremes, medical expenses contributed to 62% of personal bankruptcy claims prior to the Affordable Care Act, and remain the single largest cause today. CPME has emerged in response, seeing opportunity in reducing friction between widespread need and altruistic aspirations. Advocates proclaim the need to 'disrupt giving', upending traditional philanthropy through platform capitalism models. However, despite rhetoric implying otherwise, GoFundMe and most other crowdfunding platforms are decidedly not non-profits. Rather, they are immensely profitable, usually by taking a cut from each donation. Moreover, because personal judgments of moral worthiness are the primary determinant of donations – rather than need itself – what emerges is the assetization of virtue. Also, only certain health conditions are likely to acquire funding; health conditions of 'crisis' fare much better than chronic illness, or conditions associated with vice (thus risking further stigma and injury). Governing bodies support crowdfunding, perhaps for devolving state duties while reaffirming familial/community ties (ie. the supposed 'safety net' of neoliberalism). Clinical research groups are also redirecting fundraising efforts through crowdfunding appeals by their research participants. Yet, around 90% of CPME campaigns fail to reach funding goals. Hence, while already marginalized subjects are turned for profit,

those even further marginalized are not heard at all. This creates injurious metrics of life's worth. What burdens are imposed in compelling subjects to plead for life itself in hyper-competitive attention economies? What types of health conditions are seen deserving of aid? Are we witnessing, framed in egalitarian rhetoric, modes of governance that reflect not enforced, but ensouled neoliberalism? A positive reframing of vulnerability as entrepreneurial possibility, implying those who prove themselves as deserving will be redeemed through market-based mechanisms?

Of Social Diseases and Technical Fixes: BMGF and Tuberculosis in India *Anita Buragohain, York University, Toronto*

Recent trends in international assistance and philanthropic funding are transforming global health agendas and governance, with reverberations felt by national health programmes around the world. This paper analyses engagements by the Bill and Melinda Gates Foundation (BMGF) into tuberculosis control in India as a case study to explore some of the avenues by which new philanthropies are informing priorities and shaping approaches to disease and development. Tuberculosis has been a curable disease for well over half a century, and it is now largely absent from the developed world. Over 95% of tuberculosis today occurs in developing countries, with India alone accounting for over one-quarter of the global burden of disease. Despite being identified as a public health emergency by the WHO in 1993, tuberculosis has long been lamented as an underfunded and neglected area of global health. However, the "emergence" of Multi Drug-Resistant Tuberculosis (MDR-TB) as a health security threat over the last decade has fuelled a resurgence of both scientific interest and donor funding in tuberculosis. This paper focuses on projects and interventions funded by the BMGF over the past decade to aid India's national tuberculosis control programme, especially around the national policy objectives of promoting "early diagnosis" and "treatment completion." Specifically, the paper analyses the foundation's deployment of digital technologies, such as fingerprint sensors, to achieve better patient surveillance and MDR-TB detection in India. I argue that these technologies, increasingly invoked as indispensable for disease control, have tremendous implications for the environments of tuberculosis care and public health. They not only influence debates around appropriate technology and laboratory infrastructure, but also actively refocus the problematic of tuberculosis as a social disease. The privileging of digital technologies in BMGF backed health interventions thus offers its own narrative around the causes and determinants of tuberculosis, especially MDR-TB, as well as its patients in developing countries. Long understood to be an ancient disease as well as a modern one, this paper draws attention to how philanthropic interests are rearticulating tuberculosis as an object of global health and a disease of our times.

Session Organizer:
Hebe Vessuri, Research Center of Environmental Geography (CIGA) UNAM

Chair:
Hebe Vessuri, Research Center of Environmental Geography (CIGA) UNAM

087. That Which Arises from the (Human or Mechanical) Eye

Papers for Open Panels/That which arises from the (human or mechanical) eye
Open Panel
4:00 to 5:30 pm
ICC: E5.10

In this panel, we will take the pulse of the eye. That is, we will explore the status of visual phenomenology and the empirical gaze in current or recent scholarship within social studies of science. Studies on visual perception and its role in knowledge production have a long history across fields, e.g. early empiricism, gestalt- and experimental psychology, embodied cognition, and AI. At present, with advances in computer-aided pattern recognition, new spatial technologies are frequently designed to align with human perceptual faculties in ways that need be better understood. In other words, as computer vision and other perceptual simulation models, underpinned by machine learning algorithms, increasingly read and write the world without the "need" for direct human involvement, the creative capacities of the human eye are contested. This suggests that the mapping and interpretation of terrains invisible to the human eye results in real-world material and political expressions that are, arguably, not free from bias in regards to, for example, race, gender, and inequality. It is this landscape of explicit uncertainty that this panel seeks to explore from sociological, technical, and historical perspectives. Approaching human visual experience as a heterogeneous enterprise, hallmarked by perspectival, temporal, and indeterminate qualities, the panel puts out a call for responses to the following provocation: in our increasingly technological societies, what new ontological or epistemological insights can be gained, and at what costs, from that which arises from the (human or mechanical) eye?

Participants:

Shadow of gender: "Lena" in the eyes of her users in China *Dian Zeng, Institute of Science, Technology and Society, Tsinghua University*

For professionals in image processing which is an important field in electrical and electronic engineering, the name "Lena" which represents a standard testing picture of image processing might sound familiar. The picture coming from the famous male adult magazine Playboy was originally a centerfold with an image of a naked female model. After being used for the first time in a scientific conference of image processing in 1973, the picture has been widely used in the field and has been blamed for the gender bias in the picture and in the field. However, even until now, we could hardly find a specified study on what "Lena" is like in the eyes of her users. In vision studies which is a newly rising field of STS (Science, Technology and Society), studies about what arises from the eyes of scientists would be very meaningful and constructive. In my study of "Lena", I attempt to explore and present what the professionals who are the users of "Lena" have seen in "Lena" about the gender aspect of the picture. As an empirical study, I use semi-structured interviews as the main approach to make the insiders related to "Lena" speak for themselves in a top university of China. My study has found the vague attitude of the insiders towards the gender aspect of "Lena" and discovered their mechanism of solving the ambivalences in their interpretations. There is a manifest interpretation system of scientific "Lena" and a potential interpretation system of social "Lena" existing in the eyes of "Lena"'s users at the same moment. The factor of gender in "Lena" walks with each of her users, like a

shadow. In such an image-reading time in contemporary China and many other districts, we cannot underestimate the influence of image. With the rapid development of digital technology, by what we see, we are reshaped. Gender should be a significant issue to be seriously considered in image studies. I believe the study of "Lena" could contribute to empirical and transnational studies of STS concentrated on the gender aspect in vision.

Partially-sighted Cyborgs: debunking myths, exposing the truth *Nalini Haynes, UniCanberra*

New Materialism acknowledges agency in all facets of disability: material embodiment, lived experience, discourse, and social barriers to participation. New Materialism facilitates vision impaired researchers' immersion in our research, acknowledging the varied reality of our non-normative modes of seeing and experiencing the world. My research examines representations of albinism in speculative fiction. Speculative fiction tends to omit vision impairment as part of albinism and, therefore, usually omits existing disability access technologies or misrepresents these technologies. Side-effects of these representations include reinforcing misconceptions while failing to educate the public about vision impairment, the capabilities of vision impaired people and existing disability access. When speculative fiction and current technological advances engage with vision impairment, these representative events inspire interesting and, often, unrealistic ideas in the public. These ideas are often based on disability academic David Bolt's 'ocularcentric social aesthetic' (sight is considered the primary and essential sense) or on the infallibility of science (e.g. 'Why don't you have surgery to fix your eyesight/get bionic eyes/use echolocation?'). Publicity around current developments of bionic eyes seems to have inspired the public to believe Jordi La Forge's (a character in Star Trek: The Next Generation) bionic eyes have arrived, and Daredevil implies that vision impaired people can use echolocation for parkour without peril. Vision impaired people are neither as super-powered as Daredevil nor as incompetent as the ocularcentric social aesthetic assumes. Disability access exists, facilitating our participation in education, employment and society, but it is more complicated than 'normative' knowledge aggregates allow.

A Digital Second Eye: An Ethnographic Study of Making Medical Imaging AI Development *Heesun Shin, KAIST (Korea Advanced Institute of Science and Technology)*

As technologies of machine learning and computer vision advance, a growing number of enterprises are applying these technologies to medicine. Based on an ethnography at an AI startup in South Korea, which is largely composed of scientists and doctors, I examine the process in which a medical imaging AI is shaped through a selective simulation of human vision and continuous negotiation between doctors and scientists. The development of medical imaging AI diagnostic software involves two steps: training the model with large sets of paired data of medical images and diagnostic information and then visualizing the result into a human-readable format. I consider the medical imaging AI as an attempt to produce a "digital second eye" and show how a doctor's diagnostic ability is inevitably reduced to visual interpretation of medical images, while other medical expertise such as anatomical knowledge is excluded from the AI training process. Following the tensions and compromises between scientists and doctors in making the software, I then point out that simulation of a human eye allows the software to encompass not only codes and algorithms but also heterogeneous assumptions and understandings on medical knowledge, practice, and expertise. While scientists understand medical diagnosis as pattern recognition, which they believe can be better achieved with computers, doctors make medical diagnoses based on clinically proven medical experiences. Grounded in an empirical study of an ongoing project, this paper shows how disputes between scientists and doctors are provoked, mediated, and settled in the making of medical imaging AI.

Sensory ethnography and the bionic eye *Cordelia Erickson-Davis, Stanford University*

In the computational theory of vision, the world consists of patterns of light that reflect onto the retina and provoke neural activity that the individual must then reconstruct into an image-based percept (Marr 1979). "Seeing" turns into an optimization problem, with the goal of maximizing the amount of visual information represented per unit of neural spikes. Visual prostheses - which endeavor to translate visual information like light into electrical information that the brain can understand, and thus restore function to certain individuals who have lost their sight - are the literal construal of computational theories of perception. Theories that scholars of cybernetic studies have taught us were born from data not of man but of machine (Dupuy 2000). So what happens when we implant these theories into the human body? What do subjects "see" when a visual prosthesis is turned on for the first time? That is, what is the visual phenomenology of artificial vision, and how might these reports inform our theories of perception and embodiment more generally? This paper will discuss insights gathered from ethnographic work conducted over the past two years with developers and users of an artificial retina device, and will elaborate on a method that brings together institutional ethnography and critical phenomenology as way to elucidate the relationship between the political and the perceptual. Marr, D., & Poggio, T. (1979, May). A computational theory of human stereo vision. In Proc. R. Soc. Lond. B (Vol. 204, No. 1156, pp. 301-328). The Royal Society. Dupuy, J. P. (2000). The mechanization of the mind: on the origins of cognitive science.

Session Organizer:
Dian Zeng, Institute of Science, Technology and Society, Tsinghua University

Chair:
Dian Zeng, Institute of Science, Technology and Society, Tsinghua University

088. Climate Change in Context: Local Use, Creation, and Interaction with Science
Papers for Open Panels/Climate change in context: Local use, creation, and interaction with science
Open Panel
4:00 to 5:30 pm
ICC: E5.3
Climate change is often framed as a national and international concern, but entities sensitive to local climate change impacts, like cities and protected areas, must also contend with how, if at all, to

respond. The availability and role of expertise, varied institutional structures, and deep uncertainty in potential impacts and responses complicate if and how people at local scales might use scientific assessments such as projections of species extinctions or flooding frequency. However, local responses to climate change present an opportunity for learning about varied institutional responses for decision making under uncertainty in the face of the challenges laid out above. As such, this session will focus on how local entities (taking a variety of institutional shapes from across the globe) create, use, respond to, and interact with scientific knowledge in the context of climate change impacts. Relevant questions include: How are local entities using science to plan for climate change impacts and why? Who is (un)welcomed in these conversations? How do local entities adapt to varied access to resources and expertise regarding climate change assessments? How do competing scientific frameworks, assessments, or models complicate applications of science in the context of local climate change impacts? How do local social norms or policies interface with or influence climate change impact assessments? How do the dynamics of climate science and politics unfold at the local level compared to the national or international level?

Participants:

Climate Science in the US National Parks: Scale, Politics, and Contingency *Michelle Kathleen Sullivan Govani, Arizona State University*

"America's Best Idea" is in crisis. Across U.S. National Parks, glaciers are melting, swamps are drying up, and species are shifting beyond protected boundaries or dwindling to extinction. Facing these challenges, President Obama's National Park Service (NPS) director, Jon Jarvis, ordered the agency to ground management strategies in the "best available science." But such policy guidance was swiftly rescinded by the Trump administration. How do parks foster research programs that are at once relevant to contingent climate change impacts and sensitive to politics at the local and national scales? Beneath the choppy waters of national politics, individual parks must contend with climate change in context: Each site has a distinctive management culture and faces impacts unique to its resources and legislated purpose. The dynamics of climate science and politics proceed differently at each park and compared to on the national scale. Thus, parks are at once institutionally tied and independent, each creating, using, and politicking around climate change science in their own setting, while striving to abide by system-wide policies. To understand how the NPS uses climate science across scales and in uncertain and politically contentious contexts, I performed semi-structured interviews with more than 30 NPS administrators, managers, and researchers. In some instances, boundary organizations have materialized from partnerships among external researchers and parks better connecting research programs to park needs. My data also illuminate conflicts inherent to applications of science where historical value-commitments, some dynamic and others steadfast, intersect with the uncertainty of climate change impacts.

Transformations for sustainability in dynamic deltas? A Critical Analysis of Systems Approaches to Social Change *Anna Wesselink, Department of Integrated Water Systems and Governance, UNESCO-IHE Institute for Water Education; Oliver Fritsch, Department of Geography, University of Leeds; Jouni Paavola, University of Leeds*

Resilience, adaptation, transition and transformation have all been proposed as routes to sustainability and they have become buzzwords in development-related research and policy. These concepts all originate from the socio-ecological systems (SES) and socio-technical (ST) systems research. We examine the notion of transformation in particular, because it is widely expected to help address environmental, social and economic problems simultaneously. We analyse to what extent the conceptualisation of deltas as SES and/or ST systems could inform transformations for sustainable delta living in the future. In changing climate, sustainability is of particular importance for delta societies since the presence and impact of water from rivers and seas is overwhelming both as live-giver and a threat. We suggest that deltas should be considered complex socio-ecological-cum-technical systems, because technological interventions shape the relationships between societies and delta environments. We also examine the prescriptions of change offered by SES and ST systems research, adaptive management (AM) and transition management (TM) to assess whether they are technically and politically sufficient, feasible and acceptable. We conclude that while the experimentation advocated by AM and TM may support short-term local adjustments, their up-scaling to delta level is prevented by political controversy and resistance. As a result, many deltas are locked-in to an irreversible path towards collapse due to a combination of natural and societal trends. The inability of the examined systems approaches to understand and handle the role of power undermines their ability to inform transformative change.

What Do Local Officials See in Participatory Technology Assessment for Climate Adaptation? *Nicholas Weller, Arizona State University, School of Sustainability; Mahmud Farooque, Consortium for Science, Policy & Outcomes, Arizona State University; Ira Bennett, Arizona State University*

Assessing the impacts of climate change on cities presents challenges for collecting and creating projections of impacts, as well as for grounding those projections in local priorities. Public involvement in assessments of the local impacts of climate change is one way to bridge projections and local values. However, participatory exercises are not immune to criticism, which often centers on whether public involvement is substantively incorporated into decision-making. The impact of public involvement on decision-making hinges on the ways local officials use, interact with, and think about participatory exercises. Yet local official's views are rarely examined in scholarship on public participation, particularly around the flurry of proposed methods for gathering public input promulgated by STS scholars (e.g., participatory technology assessment [pTA]). We conducted interviews and meetings with local officials to explore how they interacted with, perceived, and utilized a deliberative, pTA-based forum. The forum brought together diverse residents of central Arizona, USA to assess potential impacts of extreme heat and drought and potential strategies to address those impacts. Through meetings and workshops, we sought to 1) share the opinions of forum participants with local officials; 2) identify local officials' specific interests that can be used to guide additional analysis of forum participant responses; and 3) identify pathways for future public input around climate

adaptation. Our work 1) shows how to make public input salient for local officials and 2) contributes to our understanding of how better to ground assessments of climate change impacts in local priorities.

Science Policy, Climate Science and Doing Subnational Climate Assessments *Christine Kirchhoff, University of Connecticut*

Increasingly, subnational governments including US states are undertaking climate change assessments ostensibly to generate locally relevant information more useful for informing state and local decision makers and, through the assessment process, to develop the capacity to jointly learn about climate impacts and potential responses. The rise of subnational assessments comes in response to the perception that assessments at other scales such as international climate assessments (e.g., the IPCC) or national climate assessments (e.g., the United States National Assessment) do not produce information that meets the decision making needs of state and local decision makers nor do these assessment process help state and local decision makers build capacity to learn and respond. While much has been learned about how to conduct effective assessments at the international (refs) and national (refs) scales, little research or guidance exists that informs how to conduct effective assessments at state or other subnational scales. Moreover, while scholars have interrogated climate models and their outputs for use in international and national assessments (refs), few studies that we know of addresses the question of the adequacy of climate models applied at much more localized scales. We aim to begin to fill this gap through a systematic examination of state assessments using semi-structured interviews and a workshop to understand both the science policy process that shapes assessments, challenges with climate modeling, and how climate assessments are created and the science used (or not).

Session Organizer:
Michelle Kathleen Sullivan Govani, Arizona State University

Chair:
Nicholas Weller, Arizona State University, School of Sustainability

089. Metabolic Relations, Subjects, Differences

Papers for Open Panels/Metabolic Relations, Subjects and Differences
Open Panel
4:00 to 5:30 pm
ICC: E5.4

To metabolize is to be alive. To metabolize is to be connected to specific foods, movements and environments. Metabolism is at once an abstraction representing a host of chemical processes and a powerful social metaphor. It is a way of studying the material and energy of the body and the body's relationship to consumption, transformation and destruction. In short, metabolism is good to think with. With the expansion of calculative potential at personal and public levels, a focus on metabolic relations opens new questions about science and technology's roles in selfhood, human-non human relationships, and human-environment relationships among other themes. This panel includes a wide array of papers that consider practices of metabolism research as well as the care for human metabolism as ways into apprehending the human body as a site of emerging relations, subject formations or notions of human difference.

Participants:

Mining Experience for Methods *Elspeth Oppermann, Charles Darwin University*

This paper reflects on two empirical projects that have engaged with the pervasive yet elusive problem of heat and heat stress. A transdisciplinary methodology has emerged that utilises thermal physiology, environmental monitoring, video ethnography and interviews with 'practitioners' of heat stress and its management (mine and construction workers). The researchers sought to engage both critically and productively with the ontological and epistemic contributions of our multi-disciplinary team's knowledges, technologies and materials. Heat stress was produced as multiple objects through each of these approaches. In bringing them together, we were trying to gain traction on at-once profound and mundane, universal and intimate, registers of heat (and heat stress) as a human-non-human relation. The catalyst of this effort was however the non-academic, informal experiential knowledge we developed in the process of doing the empirical work on site. Our own somatic registers provided a mechanism for communication, in part through providing 'common' experience, but also by helping to challenge the limits of what our own disciplines could 'see' or otherwise acknowledge. This is only a starting point to thinking much more deeply about how to research more-than-human becomings. It also still leaves the problem of how to communicate things that are known bodily. Default, yet also 'proxy,' numeric, verbal, visual and written modes of data collection, analysis and representation 'feel' woefully inadequate, a challenge that is even more compelling when research is conducted in already-extreme environments on the precipice of runaway climate change.

Doing Energy or Commensality? Some dissonances between dietary guidelines and social eating practices *Elsher Lawson-Boyd, University of Sydney*

One prominent yet somewhat contested response to Australia's growing obesity rate is public dietary education, a prime example being the 2013 Australian Dietary Guidelines. When analysed as a kind of bio-pedagogy, the Guidelines' strategy for intervention becomes curious (Wright and Harwood 2009). According to the Guidelines (NHMRC 2013, p. 1), 'excess energy intake' is now a key public health problem in Australia. If we are to take this at face value, what then should be done with energy? How can it be better handled by eaters? Eating will be improved, as the Guidelines advise, through calculation and control (Mol 2012). For example, one can use a virtual 'daily energy requirements calculator' to receive the 'necessary' amount of energy one requires. Yet in spite of the efforts made by the National Health and Medical Research Council, approximately four percent of Australians adhere to the recommendations (Food Australia 2016). In this paper, I am interested in how energy becomes enacted in social eating practices, or not. I ask the question: how can energy be enacted through calculative technologies and methods when rituals and rules of commensality may oppose it? By drawing on the STS term 'enactment' I engage with ethnographic fieldwork conducted at Uruguayan Social and Sporting Club. As well as having deeply affective capacities, the ways and outcomes of doing commensality starkly contrast a criterion for 'doing energy'. By integrating commensality and enactment, this

paper hopes to contribute to STS scholarship by problematising bio-pedagogical methods adopted in public dietary education.

Embodied Transformations: Standardizing Movement in Australian Metabolism Research of "Subsistence" and Wage-earning populations in Papua New Guinea *Sandra Widmer, York University, Canada*

What does it mean for a body to metabolize a sweet potato diet? How can bodies be healthy if consuming scant amounts of protein in traditional diets? To answer such questions in the 1960s, Australian nutrition researchers standardized the movements of their research participants living in different economies (subsistence and wage) in Papua New Guinea in order to ascertain embodied differences--diet, sex, race--through metabolic processes. In their emphasis on this life process, through chemical analysis of expired air, urine and feces, the nutritionists studied the material and energy of particular bodies and these bodies' relationship to consumption, transformation and destruction. As well, as the researchers compared town dwelling, wage earning protein consumers, with subsistence farming carbohydrate consumers, the researchers attempted to demonstrate differing embodiments of economic systems. They speculated that low protein diets could be healthy because of specially adapted gut flora. This paper provides a colonial policy context for the consideration of science's role in validating modern or traditional foods.

Beyond Homeostasis *Hannah Landecker, UCLA*

This talk considers the role twentieth century models of intermediary metabolism played in the constitution of ideas of homeostasis and interiority for organisms vis-à-vis their environments. These are contrasted with contemporary theories of metabolic disorder, explored via ethnographic work observing biomedical research. Homeostasis seemed that it had no end, it was all return. So what can come after it save death? Practically speaking, the topical concerns of biomedicine of beta-cell exhaustion, inflammation, genomic instability, hyperphagia, and dysbiology do. These apparently technical or medical issues will be translated here as cultural theoretical ones of the time after homeostasis.

Session Organizer:
Sandra Widmer, York University, Canada

090. Organisms and Us in Dialogue
Papers for Open Panels/Organisms and Us in Dialogue
Open Panel
4:00 to 5:30 pm
ICC: E5.5
Participants:

Birds as Designers and Insects as Clients, or Limits to Participation in Participatory Creativity *Stanislav Roudavski, The University of Melbourne*

This paper considers maximal inclusivity in participatory design, seeking to extend participation beyond humans. The central hypothesis of this work is that more inclusive participation can lead to advances in design outcomes in the context of novel ecosystems and rapid ecosystem change that is characterised by such events as species extinction, habit loss and climate change. It also acknowledges that the expansion of participation has limits, conceptual, pragmatic and political, among others. Any practical engagement with this hypothesis requires a specification of all possible participations and a reappraisal of conceptual instruments of participatory design. This reappraisal needs to consider goals of participatory design, its values, its methods and its tools. This paper seeks to extend ideas of communicative and participatory democracies towards nonhuman biota and abiotic environments. This paper engages with this theoretical trial though a practical example derived from an ongoing ecosystem-restoration project. Amongst other measures, this project proposes to introduce artificial, prosthetic replacements for absent or disappearing habitat structures, such as large old trees. Ecological research demonstrates that such prosthetic additions are already or will soon be unavoidable in many types of global habitats. The paper uses this ongoing work to construct thought experiments that combine existing and planned technical implementations with imagined or prototyped possibilities. Analysis of these experiments results in stakeholder-centred narratives that can critique existing and imagine possible future relationships within cultures and ecologies. This work contributes to STS research by systematising its understanding of participation and providing tangible cases for critique and alternative interpretations.

Experimenting in Multispecies Multidisciplinary Microbial Research: Doing STS, Doing Biology, and Doing Yeast *Erika Amethyst Szymanski, University of Edinburgh*

In the midst of what Paxson and Helmreich (2014) call a "microbial moment," social scientists are attending to microbial life to reconfigure heretofore macrobe-heavy social concepts. Simultaneously, biologists have been reconfiguring microbes as social creatures rather than predicating microbial inquiry on isolation in a Petri dish. Such changes in how biologists conceptualize microbes inform how social scientists visualize and conceptualize microbes. Here, I question the obverse—how social scientists questioning the social/scientific construction of microbes inform methodological and conceptual developments in biology—as an STS scholar working alongside yeast synthetic biologists. How can changes in scientific discourse used to bring microbes into being revise scientific protocol? How can methodological questions about microbial ethnography bring "protocol" into shared experimental space, where experiments might constitute both social scientific and biological research? How, thinking of Rheinberger's and Fox Keller's (among others) advocacy for the productivity of imprecision and ambiguity, can juxtaposing potentially incompatible-seeming "microbes" establish a productive space for mutual scientific and social scientific surprise? I conclude that particularly in dealing with microbes, with whom human interactions are so heavily mediated by our conceptual apparatus for manifesting them, lines between microbiology and social studies of science sometimes blur in ways that enable scientists and social scientists, together, to productively ask: what are microorganisms, and how do we work with them? In so doing, I reflect on working with synthetic biologists and synthetic yeast, challenges of achieving mutual epistemic legitimacy, and the necessity and timeliness of multispecies multidisciplinary microbial research.

Human-Plant Relations in Scientific Practice: Epistemology in the Vegetal Realm *Laura May Ruggles, University of Adelaide*

In this talk I explore how human embodiment informs the way that scientists relate to plants in laboratory, field, and everyday life, and how this affects the ways that plant behaviour is studied, conceptualised, and explained. I compare the study of plant behaviour with that of animals, looking at the roles that metaphor, affective relations, and pre-theoretic intuitions play in informing scientific practice, theorising, and pedagogy. I argue that an awareness of such influences can facilitate more effective and less ambiguous metaphor use in a range of contexts, and can drive research programmes in fruitful directions that enable us to study and relate to plants on their own terms, without reducing them to reflexive automata or succumbing to crude anthropocentrism.

Researcher-Native Relations: Situating Emerging Animal Models in Australian Science *Rachel Ankeny, The University of Adelaide; Karina Burns, University of Adelaide*

This paper considers researcher-animal relationships, comparing standard animal models such as the mouse and rat (which have been extensively explored in terms of their social status) with native animals as emerging models in contemporary Australian research. Native animals often hold special social and cultural significance both within and outside of their home countries. In this paper using published literature, interviews, and observations, we explore how researchers working with native Australian species think about their animal research subjects and how these attitudes or ways of thinking are influenced by broader structures such as existing norms within society and in various types of research. We contend that these native animal models simultaneously have multiple roles and types of relations with respect to researchers, but that some types of research agendas permit them to be conceptualised as non-other. Thus it is critical to understand researcher-animal relations as deeply situated in relation to the particularities of the models utilized and closely tied to scientific practices.

Scaling the CandidaHomo Ecology: Candida-writing Across Spacetimematter *Tarsh Bates, The University of Western Australia*

With the yeast, Candida albicans, I explore the complex ecologies of the human body to understand what it means to be multispecies communities—co-evolved, interdependent companion species—rather than autonomous individuals. Candida is not just "good to think with," however (Haraway 2003, 5). This paper describes a practice-led, interdisciplinary research methodology that scales the materiality, temporality and spatiality of human¬–microbial cohabitations, untangling and transforming the CandidaHomo ecology. It includes practical laboratory and art–making experiments, and material–semiotic scavenging from microbiology, art and craft, contemporary aesthetics, philosophy, pop culture, feminist, queer and trans theory, anthropology, post–colonialism, race and crip theory, ecology, environmental biological and humanities, speculative fiction, evolutionary theory, biotechnology, sculpture, media theory and imaging practices. I adapt Donna Haraway's analytical methods of figurations and the cat's cradle, Karen Barad's understanding of agential apparatuses as performative representations, Michel Foucault's scientia sexualis and ars erotica, which differentiate the mechanics of knowledge production from the pleasure of experience,

and Yoko Ono's instruction painting, which opens a work of art to chance and collaborative production. Artworks draw together the material–semiotics of these threads, in intra–active and performative resolutions of the microbiopolitics of CandidaHomo ecologies. This method opens diverse spaces for candida agency and CandidaHomo response–ability that recognise the value of practical and conceptual research and interrogate the underlying assumptions and biases of both.

Vaccines' Intricacies and Elusive Biological Processes *Roberta Pala, University of New South Wales, Sydney*

My paper investigates vaccines as complex material events, going beyond the current debate between pro or anti-vaccination advocates. I problematise the concept of a biological body, by focusing on the encounter between immune system and vaccine matter, and the diverse ramifications that emerge and cross over due to this intervention. I consider biological processes in terms of elusive, unfinished and interdependent cultural and ecological moments that remain contingent, learnt, diverse and not always predictable. Vaccines as biological compositions can elicit tensions and impact interconnected networks that entangle biological experiences with lifestyle choices, environmental milieus, genetic characters, nutritional habits, and contingent or random events. I consider how STS can help to rethink those unexplained and unexpected circumstances of vaccine failure and suboptimal immunization, often categorised and dismissed as rare exceptions, by regarding them as productive of new experiences. By giving voice to vaccines as more-than-human actants, and by manoeuvring different disciplinary influences, I analyse those circumstances where vaccines' workings remain elusive to scientific knowledge and control, in order to represent the ambivalence and complexity of the biological body. In this way, the paper will challenge ideas of bodily integrity, and will expose and welcome ecological perspectives of bodies' interrelatedness. This is in line with STS' ontological turn, as it moves from the epistemological focus on how scientific knowledge is produced to the more provocative question of how biological processes are enacted and played out contingently. My paper will insert itself in the current STS debate that considers the challenges of talking about a world that is in constant process.

Session Organizer:
Rachel Ankeny, The University of Adelaide

091. Curating Third Space – Transdisciplinary Knowledge At The Intersection Of Art, Science And The Public
Closed Panels
Traditional (Closed) Panel
4:00 to 5:30 pm
ICC: E5.6

This panel examines how knowledge is communicated, produced and shared within the third space where art and science meet the public. More than just the conceptual bridge between the two cultures of science and the humanities, the third space proposed here is a generative, public site of shared experience where new forms of transdisciplinary, empathic and ethical knowing can emerge. Moving beyond a paradigm of science communication this panel explores the civic and epistemic role of such spaces as loci for new knowledge formations that engage communities and stakeholders as well as disciplinary experts. It examines the conditions required to support this mutually enhancing exploration

through close studies of specific organisations, projects and exhibitions. The panel adopts an international perspective on the growing number of cultural organisations that are explicitly taking on the role of transdisciplinary knowledge production at a global scale, including The ArtScience Museum, Singapore the Museum of Applied Arts and Sciences, Sydney, The Science Gallery (international) the Centre for Contemporary Culture, Barcelona and The Wellcome Trust, London. It examines particular models of international collaboration deployed by these organisations including co-commissioning, iterative touring and re-curating, that build transnational arguments, whilst responding to local issues and conditions. The panel examines the kinds of interdisciplinary methods required to research the experience of participants in such spaces. In particular, it focuses on a group-based psychosocial method – The Visual Matrix – designed to investigate shared aesthetic experience, and to capture the kinds of knowledge that emerge in third space.

Participants:

Panel Presenter 1 *Katie Dyer, Museum of Applied Arts and Sciences*

Panel Presenter 2 *Lynn Froggett, UCLAN*

Panel Presenter 3 *Jill Bennett, UNSW*

Jill Bennett

Panel Presenter 4 *Lisa Bailey*

Session Organizer:

Lizzie Muller, UNSW

Chair:

Lizzie Muller, UNSW

092. COMPOSTING Feminisms and Environmental Humanities 4. Beginnings and Endings

Papers for Open Panels/Composting Feminisms & Environmental Humanities

Open Panel

4:00 to 5:30 pm

ICC: E5.7

Imagine the process of reading and writing as composting. Matters break down and re-emerge as new matters. In the spirit of a feminist politics of citation, how might we attune ourselves to the ways in which new ideas are always indebted to writings, readings and practices that have come before? What and how are feminist genealogies composted in and through the Environmental Humanities? What concepts are especially fruitful, and why? In what forms do these ideas re-emerge? How are these genealogies acknowledged? What ideas are yet to be added to the Science and Technology Studies (STS) compost pile? Composting, as a feminist practice, has been taken up by a University of Sydney-based reading and research group of cross-institutional, trans-disciplinary scholars exploring the traces, legacies and intersections between inclusive feminisms and broad Environmental Humanities. Started by Dr Astrida Neimanis and Dr Jennifer Mae Hamilton in September 2015, the Composting Feminisms and Environmental Humanities group wishes to connect with transnational composting kin through this open panel at 4S. STS & Environmental Humanities share many key feminist interlocutors and this panel is an opportunity for discussion of similarities and differences.

Participants:

Composting Feminisms and Environmental Humanities: A Critical Genealogy *Jennifer Mae Hamilton, Unversity of New England; Astrida Neimanis, University of Sydney*

We propose that thinking about environmental humanities as a kind of composting allows us to map a genealogy of our field as arising from feminist scholarship and praxis. Taking Donna Haraway's latest texts and the material metaphor of the domestic composting system as our points of departure, we suggest that composting demands that we pay attention to our critical metabolisms; composting reminds us that the particular kinds of scraps fed into the compost pile shape the friability and absorbency of our messy co-becomings. In our paraphrase of Haraway, it matters what compostables make compost. This, we argue, is why feminist composting matters. Our argument unfolds in two related directions. First, by examining the field's origin stories, we identify the important influence of feminist thinking within the environmental humanities. We observe that while key feminist scholars or concepts are frequently mentioned in these stories, their feminist investments are rarely engaged as such. As a result, the originality and value of the environmental humanities is compromised. Second, given the ways that feminisms have already enriched environmental humanities scholarship, we suggest that composting as scholarly tactic ought to be taken up further. Concomitantly, though, we insist this be done with care, and in consideration of feminism's own disavowals, specifically in relation to its colonial inheritances. In short, our work is both to acknowledge the ongoing work of feminism's muddy offerings in environmental humanities and to seek opportunities for carefully composting the insights of inclusive feminisms with matters of environmental concern. Author Bios: Astrida Neimanis is a Senior Lecturer in Gender and Cultural Studies at the University of Sydney. Jennifer Mae Hamilton is Lecturer in English Literature at the University of New England, Armidale.

Turning over the compost: Feminisms in the world-ecology framework *Rebecca Pearse, Department of Political Economy, University of Sydney*

A healthy compost requires both turning over and a variety of materials. So does ecological-social theory. This paper asks, is there enough space and food for feminist thought to thrive in/with ecological Marxism? Socialist feminist theories of social reproduction and capital accumulation have re-emerged in ecological political economy in recent times. Notably, gendered relations of social production feature in Jason Moore's Capitalism in the Web of Life (2015) and even more strongly in A History of the World in Seven Cheap Things (Moore & Patel 2017). If feminist theories of social reproduction socialised marxian understandings of labour-power by revealing the gendered origins of our capacities to do work, we might conclude Moore's world-ecology framework succeeds in both ecologising and socialising labour-power at the same time. However, there are reasons to proceed cautiously as feminists engaging with capital as world-ecology. For instance, gender relations figure as functional to capital accumulation throughout Moore's history, conceptualised under the rubric of appropriation. This rendering of gender within the ecological household, does not see gender in capitalist exploitation, eliding rich and more varied intellectual histories addressing gender/race/class/caste in capital's heartlands, e.g. in wage work, corporate structures and the state. This paper turns over feminist socialist and postcolonial dialectics of gender and capital, in order to see what new matters arise for the world-ecology project.

Composting Feminisms: Queer Ecology & Val Plumwood's "Eye of the Crocodile" *Ariana Russell, University of Sydney*

In 1985 Val Plumwood notoriously survived a crocodile attack. While kayaking alone in Kakadu National Park in Northern Australia during the wet season, she was "seized between the legs in a red-hot pincer grip, and whirled into the suffocating wet darkness below" (Plumwood 30). This paper proposes that "composting" queer ecology with queer feminist work on trauma can open to new readings of Plumwood's account of her death-roll with the crocodile. Broadly defined, queer ecology draws upon queer theory and sexual politics to inform our understandings of environmental, biosocial, and ecological matters, and vice versa (Mortimer-Sandilands and Erikson 2010). By drawing on this framework, and placing it alongside queer feminist theorist Ann Cvetkovich's work in An Archive of Feelings, we can ask: How might Plumwood's Eye inform our understandings of the relations between trauma and the erotic in ways that reimagine both, within an ecological context? Val Plumwood was (and continues to be) a key figure within the environmental humanities and environmental feminism. This paper thus seeks to attend to some of the genealogies of feminist environmental humanities while also pushing their insights in new directions – directions that even Plumwood herself may not have anticipated.

Composting Death *Jennifer Loureide Biddle, National Institute of Experimental Art UNSW Art & Design*

This paper is a fictocritical account of the nursing to death of my two parents in Columbia, Missouri over the same two and half years that saw the killing of Michael Brown in Ferguson, the rise of Black Lives Matter and the election of Trump; events that saw me return to my home in the Midwest for the first time for longer than the few days it had been for over three decades; bringing my own children back with me, the sound of crickets and fireflys; the packing up of their home of forty years. And while I appreciate that the violence and undoing of these events are not related cause and effect nor commensurate according to a logics of scale - I do not want to be 'whitesplaining', in this sense, reducing what are differential inequities or to be making my narrative the one - nevertheless the events are materially entangled in what Karen Barad might call a 'strange topology' or 'geopolitics inside a morsel… an implosion/explosion of no small matter.' It is this matter and the mattering that has taken place since, that ties racism, the rise of neo-facism, to the death of my parents, to a hauntological that won't quit; a brutal facticity of indeterminancy that is constitutive; what I call composting death. This then is a paper of the slow, of a staying with, not a working through; of compost as process, as condition; of what death, grief does; festering, irresolve, heat on the rise.

Session Organizer:

Jennifer Mae Hamilton, Unversity of New England

Chair:

Lindsay Kelley, UNSW Art & Design

Discussant:

Susanne Pratt, University of Technology, Sydney

093. Diversifying Agri-food STS Scholarship Across Transnational Borders II

Papers for Open Panels/Diversifying Agri-food STS scholarship

Across Transnational Borders
Open Panel
4:00 to 5:30 pm
ICC: E5.8

We welcome papers on a wide range of agricultural and food topics, with a view to expanding STS scholarship into new areas. To date, much STS work on agri-food topics has focused on genetically engineered foods, the Green Revolution, and industrial agriculture. However, as Iles, Graddy-Lovelace, Montenegro, and Galt (2017) suggest, food systems are complex, multi-dimensional, and involve long supply/trade chains that stretch around the world. Agri-food STS is rapidly growing to encompass many 'new' sites, geographies, and agricultures. Possible topics include the regulation of food safety and pesticide risks, the politics of agroecological knowledge production vis-à-vis industrial food regimes, farmer-to-farmer learning exchanges, the growth of automation (e.g., drones and mechanized harvesters), and new generations of genetically engineered crops (e.g. CRISPR). The connections between nutrition and health are of interest. Corporations are developing and marketing an array of foods and diets for developing regions. Standards also continue to coordinate across huge agri-food infrastructures, and to define what sustainability means for supermarkets. Ongoing corporate consolidation is having a major impact on the nature of S&T in agri-food systems (e.g., seeds, chemicals, labor). In particular, we encourage contributions regarding agriculture and food systems in Australia, New Zealand, and the Asian region more broadly. We will organize specific panels around clusters of key themes and concepts, paying attention to stimulating transnational conversations between scholars working on these themes. We are especially interested in papers that critically appraise (1) efforts to foster sustainable intensification and (2) the development of alternative, sustainable agricultures.

Participants:

Seed-Links: Connecting You to Your Food Web through the Visualisation of Diverse Agri-Food Systems *Fern Wickson, GenØk Centre for Biosafety; Amaranta Herrero, GenØk Centre for Biosafety; Rosa Binimelis, GenØk Centre for Biosafety & University of Vic*

The Agri/Cultures Project is working to develop novel concepts, methods and empirical knowledge for understanding the complex relational networks of different cultures of agriculture. One of the project's primary aims has been to explore new ways to capture and visualize these relational networks in engaging and accessible ways. The project has been motivated by the need to: a) see and assess genetically modified organisms not as isolated technological objects but as dynamic networks of social, ecological and technical relations entangled in integrated systems, and b) compare this model of agriculture with other approaches. Over the last four years, the project has been creating comparative cartographies of different agri/cultures (specifically, genetically modified, chemically intensive, certified organic and agro-ecological systems of production). It has been doing this through multi-sited ethnographic research in Spain and South Africa, inspired by the 'follow the thing' methodology. To visualize and compare the different agri/cultures, the project has now developed an interactive website (Seed-Links) as an innovative form of science communication. The aim of the website is to provide a pedagogical tool for exploring the differences that exist across different agri/cultures and thereby empower people to make more informed choices about

the food they consume and the networks of relationships they invest in and build through their everyday choices. This presentation will showcase the seed-links website and seek feedback on the approach as a way of reconceptualising biotechnology and its analysis from an STS perspective and as a method for performing transnational research on diverse agri-food systems.

The Technology Politics of Mechanizing Crops: Insights from Californian Agriculture *Alastair Iles, UC Berkeley; Patrick Baur, UC Berkeley; Ayla Peters, University of California at Berkeley; Brenly Stapley, University of California at Berkeley*

Across the 20th century, machines have displaced much of the labor used on industrialized farms. Harvesters, pruning machines, weeding technologies and other examples have come to define what the modern farm looks like. Drones, GPS-directed harvesters, and sensor-driven input machines are another stage in the evolution of farms. Mechanization is viewed as something that is natural and inevitable. But this trend hides large differences in the extent to which diverse crops are actually mechanized, and in the reasons for this transition. What leads to an agricultural crop becoming mechanized? What factors make a crop more susceptible to being mechanized? To begin understanding these, we examine the historical trajectory of mechanization in California's agricultural industry from the 1940s to the 1980s. Using primary empirical data from industry trade publications, national and local California news outlets, and University of California extension reports, we compare patterns of mechanization between several fruit, nut, and vegetable crops. Adapting a social construction of technology framework, we analyze the politics and dynamics underlying these patterns. We find that mechanization can penetrate into crops to vastly different degrees because of a combination of labor struggles, university research interests, biological characteristics, and pressures from downstream in food supply chains. We conclude with some implications for automation in today's agricultural industry.

The Web of Transnational Cultivation and Benevolence: Taiwan's contemporary networking of alternative farming and self-help agronomy *Yi-tze Lee*

This paper aims to delineate the inner dynamics of transplanting agronomies from KKF of Thailand, Permaculture of Australia, and Shumei organization of Japan to Taiwan, and the process of forming networking among the technology literate farmers. Based on the idea promoted by the group leader of such networking, "learning is a process of hacking," farmers searching for alternative agronomies consider that new agriculture should be a "movement of open-source activities on the land." Connecting agricultural productivity with spiritual benevolence, these groups adopt spiritual cultivation and environmental observation into technological transformation for the land and crops. The farming network group has established itself transnational microbial knowledge as well as religious devotion of environmental restoration, while the official agricultural extension goes for hierarchical information. Farmers' networking based on this movement becomes an exciting front in the array of organic farming. The discussion from this microbe-hunting group sheds light on the way of transplanting agronomical technology, a new

networking of knowledge sharing, and the meaning of hacker in the practice of agriculture and environmental awareness. In this paper, histories of the three alternative agronomies and their religious/spiritual connection to environmental beliefs will be explored. Furthermore, how these organizations advance their practice into systematic agricultural techniques and practice for transnational groups is taken as echoes for contemporary awareness of food safety and efforts to the convergence of environment and spiritual transformation of farmers themselves. My discussion will focus on the transnational formation and localization of these three alternatives as a means of contesting agronomies against the hierarchical knowledge from governmental sectors and its market ideology. In the end, this article aims to reflect the meaning of agricultural practice as hacking based on the idea transnationalism, spirituality, and networking.

Understanding Processing: Mega Food Parks and Technological Interactions in the Indian Food System *Barkha Satish Kagliwal, Cornell University, Department of S&TS*

Food wastage due to a lack of storage and adequate distribution has inhibited food security in India. The government has responded to this problem by incentivizing food processing by financing 41 'Mega Food Parks' (MFPs) as infrastructural hubs. Government visions envisage that MFPs will become a modern technological solution for prolonging the shelf life of foods in the long term. At the same time, research on food quality indicates that processed foods cause over-nutrition and related health issues. Through 20 interviews and 4 factory visits with producers of processed foods on the corporate side; and regulators and policymakers on the government side, I study the interactions between technology and social order in the processed food sector. Drawing on STS research on food infrastructures; automation; and food standards I ask: what is the role of food processing technologies in changing the Indian food system? How does technology make food valuable in the transnational agri-food sector? In critically examining the policy move to develop MFPs I illuminate the role of the Indian state in shaping a transition to increased production of processed foods for both domestic and export markets. I contribute to STS by examining the unique technological combinations that emerge due to the specific infrastructural form and make-up of MFPs. I bring the Global South perspective on processing technologies by analyzing the transnational flows of equipment, foods and standards as they shape the nutrition content of food consumed in both domestic and international settings.

Session Organizers:
Alastair Iles, UC Berkeley
Gyorgy Scrinis, University of Melbourne
Chairs:
Gyorgy Scrinis, University of Melbourne
Alastair Iles, UC Berkeley

094. Collecting as a Hobby
Papers for Open Panels/Collecting as a hobby: An STS exploration
Open Panel
4:00 to 5:30 pm
ICC: E5.9
Participants:
Constructing Collection: Possibilities and Perspectives *Ravi*

Shukla, Jawaharlal Nehru University

Collection as an activity includes the technology-mediated tasks of finding, acquiring, storing and sharing of objects or artifacts. While the technologies used to aid in these activities is reflective of a particular STS context, the artifacts being collected ("collectibles") may cut across these spatial and temporal boundaries. Thus, a coin collector in present-day France having a passion for collecting Ptolemic coins, in a sense, makes present the science, technology and society of a different time and space. From a more social standpoint, are not all communities, collectives or collections of people who share common characteristics and behavior? Animals too may be seen as collectors - think of pack-rats, birds building nests, ants and bees storing food. From a more abstract perspective, are we not, both collections and collectors? Not just of bone, sinew and body parts, but also of thoughts, memories, emotions, hopes and fears? Thus, on the one the hand construction of the idea of collection shapes the possibilities that open up, on the other, the activities of the collectors are shaped by the technologies used to perform them. From an STS perspective, it does seem to completely fit either the idea of social construction or of autonomous technologies, yet what we collect, consciously or otherwise, in a sense, is indicative of our identity. In the session, I will speak about an ongoing study that uses the framework of collection for studying the use of the internet in India.

Displaying Expertise: Science Fair Collections and Adolescent Scientific Communities in the United States, 1928-1957
Sarah Scripps, University of Wisconsin-Stevens Point

This paper traces the formation and evolution of student hobbyist collecting practices for science fair displays, focusing on the ways American adolescents established communities of practice by sharing their collections through competitions. Over the course of the twentieth century, generations of American children conducted their first experiments by crafting science fair projects. From fossils to fauna, hobbyists carefully crafted the arrangement their collections to be judged by peers and adults alike. This paper argues that the creation of such public displays were central to shaping an adolescent scientific culture in the United States during the early to mid twentieth century. The research is grounded in a source base that includes photographs of science fair displays, project descriptions written by students, popular magazines, and archival collections of sponsoring organizations. For STS scholars, adolescent collections also raise important philosophical questions regarding the epistemology of children's experimentation. From vibrant three-dimensional dioramas of the Progressive era to postwar argument-driven text panels, these displays reveal students' changing beliefs about what counted as faithful scientific evidence. In the process, it demonstrates how science fair collections provide an entry point for how adolescents conceived of science on material, social, and epistemological terms over the course of the twentieth century.

Everything Old is New Again: Thrift Store Collecting *Dawn Neill, Cal Poly State University, San Luis Obispo*

Thrift stores are retail organizations dedicated to the resale of a variety of donated used goods to raise money for stated charitable causes. Thrift stores in America have a long history associated mainly with providing material goods that meet the needs of cost-conscious or cost-constrained consumers. These material goods are imbued with cultural significances related to both the material objects themselves, as well as the culture and class of consumers who have built the thrift store economy. The material culture of thrifting has historically been shaped by poverty, social stigma, and material needs. However, more recently, the thrift store has become an emergent locus for a new type of consumer - the collector. This paper examines thrifting - both the process and the product - as conspicuous consumption, the display of wealth as an expression of economic power, as opposed to a pathway for meeting basic needs in the face of scarcity. In doing so, this paper will take a critical approach to understanding the meaning and culture of thrifting from an autoethnographic perspective. It is suggested that certain types of thrift store finds may display meaning and value that transcend their monetary cost while also shaping the identity of a new economy of conspicuous collectors. This paper contributes to emergent research in Science, Technology, and Society examining collecting as practice and product.

Session Organizer:
Ravi Shukla, Jawaharlal Nehru University

Chair:
Ravi Shukla, Jawaharlal Nehru University

095. Dyason Lecture 2018 by Professor Helen Verran: Dancing with Strangers: Imagining an Originary Moment for Australian STS
Single Paper Submission
Special Event
6:00 to 7:30 pm
Outside Venue: TBC

Helen Verran will be presenting the distinguished plenary lecture for the Australasian Association for History, Philosophy and Social Studies of Science (AAHPSSS). In 1788 in what would in a few years become Sydney, not too far from the site where in 2018 a large group of scholars will meet to critically discuss the roles of sciences and technologies in modern cultures and societies, a group of sailors and soldiers danced with the strangers who had been warily awaiting them when they arrived on shore. Science and technology had also arrived, albeit to an extent unheralded. Of course, the strangers who at first hesitantly welcomed the group they assumed were mere temporary visitors, had their own highly elaborated traditions of knowing and doing that could with careful translation also have been understood as sciences and technologies. It is recorded in the colonial archive that as a start to that translation work, the two groups danced together. Each presumably also showed the other how to dance 'properly'. In this lecture I take this promising moment in which knowers in disparate traditions engaged each other with curiosity and respect, as occasion to articulate (another) originary moment in Australian STS. Reception: 6pm Lecture: 6:30pm

Session Organizer:
Helen Verran, Charles Darwin University, Casurina, NT

096. Queer/STS Meet-up
Single Paper Submission
Special Event
8:00 to 9:30 pm
Outside Venue: TBC

This is the fourth annual meetup for scholars at the intersection of LGBTQ Studies and STS. This year's event will take place on Thursday, August 30, at 8pm-10pm at The Beauchamp Hotel

THURSDAY

(upstairs bar) – a welcoming bar in the middle of Darlinghurst, the historic centre of Sydney's LGBTQ community. Come and socialise with other scholars and graduate students working at the intersection of STS and queer studies! Please RSVP by Friday 24 August by registering here* *(this will help us plan the catering, but last-minute joiners are welcome too) Directions: The Beauchamp Hotel is on the corner of Oxford St and South Dowling St, Darlinghurst Questions? Contact the organizers: Anne Pollock (anne.pollock@kcl.ac.uk) and Kane Race (kane.race@sydney.edu.au). This year's Queer STS Meetup is generously sponsored by the University of Sydney's Department of Gender and Cultural Studies and the MIT Department of Anthropology
Session Organizers:
   Kane Race, University of Sydney
   Anne Pollock, Georgia Tech

FRIDAY, AUGUST, 31

097. National Committee for History and Philosophy of Science meeting
Single Paper Submission
Business Meeting
7:30 to 9:00 am
ICC: E5.6
Annual meeting of the National Committee for History and Philosophy of Science, a committee of the Australian Academy of Science.
Session Organizer:
    Joan Leach, Australian National University

098. The Invisible Aspects of Infrastructure 1: Knowledge, Research & Education
Papers for Open Panels/The invisible aspects of infrastructure
Open Panel
9:00 to 10:30 am
ICC: C2.1
Infrastructure has long been of interest to STS scholars – different types (transport and communication), studied from different perspectives (historical, economic, ethnographic). One standard definition is that infrastructures are only noticed when they do not work, but much infrastructure is very present – it's hard to miss road and rail networks, and digital networks depend on massive investments in cables, satellites and servers. In this first session (of two), we focus on digital infrastructures in science, research and education. Knowledge work depends not only on classification (in labs, databases, libraries) but also on the invisible work of technicians, software engineers and information professionals. But this is the point made by Leigh Star and others – what work is visible to whom, when and where? This session opens up discussion about the invisible aspects of contemporary knowledge infrastructures, by bringing together insights from STS about socio-technical ensembles together with ideas from (Marxist) sociology and political economy. Presenters and audience members are invited to reflect on the meaning of hidden infrastructures and to what extent STS can recover the significance of infrastructure that has disappeared because it is taken for granted, as in debates around the 'post-digital' that posit the internet as being 'taken for granted'.
Participants:
    Prototypes for Openness: Platforming Non-Commercial Open Science Infrastructures *Kyle Harp-Rushing, University of California, Riverside*
    At a small but influential nonprofit in North America, politics and practice are matters of platforming. Open source web software developers, metascience researchers, and open science marketer/evangelists-working in the same open office space-collaboratively engineer social prototypes-technical assemblages designed to repair sociality (Turner 2016). A free and open-source workflow management platform, preprint servers, reproducibility studies, and carefully curated community relationships are all created to (re)align the routine practices of researchers with Mertonian values of transparency and data-sharing. Over the course of three months, I gathered stories of Open Science platforming. I asked employees to connect their stories to the meanings and significance of various technical minutiae (embedded in, outside, and between software), examining the subtle but meaningful ways they figure in crafting alternative possibilities for research and

experimentation. I participant-observed in several design meetings and impromptu discussions, sat in during paired code reviews, and had many informal conversations during the workday and after hours. In this paper, I explore a concern with "platforming" to underscore what STS scholars have described as contingent possibilities of becoming-with technical things. I argue that, while their institutional mission is designed in relation to generic categories of research practice (i.e. shifting Science, rather than specific disciplines), their strategies resist epistemic foreclosure; they remain committed to multiplicity, flexibility, and modularity. Finally, I explore the infrastructural (including ideological) difficulties of bringing non-commercial research sharing platforms "to scale" in the midst of extractive appropriations of openness and epistemic uncertainty by rent-seeking commercial/predatory journals and reactionary politicians.
    Upturning Infrastructure: Obfuscation, Invisibility, and the Material Contours of Knowledge Infrastructures *Robert Montoya, University of California, Los Angeles; Gregory Leazer, UCLA Dept of Information Studies*
    In 2003, a blue-ribbon panel appointed by the U.S. National Science Foundation (NSF) convened issued a report on cyberinfrastructure, known as the "Atkins report." Since that time, the term has been taken up in various scholarly circles and the concept has evolved, including, for example, the NSF workshop "History & Theory of Infrastructure: Lessons for New Scientific Cyberinfrastructures" led by Edwards and Bowker (2007) and another NSF workshop led in 2012 again in part by Edwards and Bowker entitled "Knowledge Infrastructures: Intellectual Frameworks and Research Challenges" (2013). Of course, these reports build upon and extend on the body of infrastructure studies. Steven J. Jackson defines "infrastructure" as the "social and material forms foundational to other kinds of human action," but clearly the concept of "infrastructure", understood both literally and as a metaphor, implies more than that. We wish to discuss and highlight some of the contributions of infrastructure studies to our understanding of information. We are particularly interested in the notion of invisibility--how the notion of infrastructure obscures or reveals important aspects of documentary and other forms of information work, and how it erases the most essential contributions of information workers. Librarianship and other information professions have always been understood as a form of social interaction, between and amongst people and documents. The notion of infrastructure adds "materiality" to our conceptualization, a process already underway through the adoption and focusing of the term "information." Notions of knowledge infrastructure hasn't highlighted the social, it has diminished it through dilution.
    The Room Where It Happens: The Hidden "Business" of Infrastructure in Social Science Data Archives *Kalpana Shankar, School of Information and Library Studies, University College Dublin; Rachel Williams, Simmons College; Kristin Eschenfelder, University Of Wisconsin-Madison*
    There has been an increasing interest in the sustainability of data infrastructures, including a late 2017 report released by the OECD on business models employed by

data archives to stay sustainable. However, there is little agreement on what constitutes a business model and from the STS perspective, there is been almost no discussion of the term and its enormous (if hidden) shaping of work. Drawing upon our ongoing comparative study of institutional sustainability and longevity in Social Science Data Archives (SSDA) in the US and UK, we draw on John Law's approach to organizations as "bundles of resources and capabilities" to examine the invisible work of creating "the business model" imaginary. We focus our analysis on three distinct SSDA which we have been studying through organizational documents, interviews, and reports, created over fifty years. By empirically examining the organizational practices of SSDA over time, we show how arguments around value and valuation, stakeholders relations, and the management of revenue are deployed, enacted, and modified by actors to maintain their respective infrastructures over time. We synthesize these findings to provide an integrated approach to understanding business models in other information infrastructures. Our paper contributes to an STS-inflected approach to organizational studies that foregrounds finances, value, and business – terms that need critique but invisibly and visibly influence the choices actors make in infrastructure creation, deployment, and maintenance. In short, the "business" of infrastructure is a fruitful (and still underdeveloped) are of STS scholarship and infrastructure studies.

Session Organizer:
Sally Wyatt, Department of Technology and Society Studies, Faculty of Arts and Social Sciences, Maastricht Univer

Chair:
Tim Jordan, University of Sussex

Discussant:
Sally Wyatt, Department of Technology and Society Studies, Faculty of Arts and Social Sciences, Maastricht Univer

099. TRANS-disciplinary Research Through STS Practice
Papers for Open Panels/TRANS-disciplinary research through STS practice: The co-creation of knowledge and collaboration
Open Panel
9:00 to 10:30 am
ICC: C2.2
STS has a key role in helping to create transdisciplinary research programmes that encourage collaboration and shared knowledge creation. Transdisciplinary research programmes are needed if we are to address the greatest challenges of our times, such as climate change. In attempting to understand the process of transdisciplinary research, we must first come to terms with different forms of knowledge. In the creation of transdisciplinary research programmes, such as the New Zealand Government's National Science Challenges, what makes these collaborations effective, productive and satisfying programmes for all participants? How do different experiences and understandings of the world, such as indigenous knowledge and neoliberal governmentalities interact and co-exist in transdisciplinary research? How can pre-existing ideas (disciplinary concepts or policy) that may underpin transdisciplinary research be re-configured to respond to current social, economic and environmental issues? This panel seeks to explore how knowledge is co-created within transdisciplinary research through STS practice, and it seeks to examine the opportunities, challenges and the reality of engaging in transdisciplinary dialogue and collaboration to create meaningful change in our world.

Participants:

A Spectrum of Collaboration: From Co-operation to Co-production *Suzanne Vallance, Lincoln University; Andreas Wesener, Lincoln University; David Conradson, University of Canterbury; Sarah Edwards, Lincoln University; Hirini Matunga, Lincoln University*
This paper reports on the early stages of a collaborative research programme originally entitled 'Learning Space: Inner City Christchurch - New Zealand's Largest Urban Redevelopment Project' carried out as part of New Zealand's National Science Challenge Building Better Homes, Towns and Cities. Our early aim was to identify and detail innovative projects and programmes that, although undertaken as part of Canterbury's earthquake recovery, were transferrable to other non-disaster contexts. Importantly however, in our attempt to collaborate with each other as well as our research participants and potential end-users of our research over the last 12 months, the aims and objectives have shifted significantly. Here we detail our research journey where the destination has been negotiated and, in so doing, present some preliminary ideas around a spectrum of collaborative research that ranges from co-operation to co-design through co-creation to co-production. We then outline key challenges associated with various points along this spectrum. These include – but are by no means limited to - issues around funding cycles and timelines, our participants' own needs for information and knowledge, and epistemic differences between disciplined analytical enquiry that emphasise theory and the expertise of practitioners concerned with applications and implications. These challenges then lead us to questions about 'transdisciplinary dialogue and collaboration to create meaningful change' where we ask 'meaningful for whom'? We suggest that this spectrum illustrates not just different challenges but also various opportunities to develop an infrastructure that better connects practitioners and researchers.

A guide to the social study of science and technology within the context of transdisciplinary research: challenges, pitfalls and optimism *Casimir MacGregor, BRANZ; Claire Tanner, The University of Melbourne*
Across the globe complex issues are redefining people's relation to each other and the world around them. Researchers from different disciplines are increasingly working to jointly create new conceptual, methodological and translational innovations that go beyond disciplinary specific approaches to address the critical issues at hand – such an exercise is one in transdisciplinary research. By utilising an autoethnographic methodology, we outline our experiences of engaging in transdisciplinary research. The first example examines a research team investigating stem cell tourism, whereby patients would travel overseas for unproven stem cell therapies, undertaken as part of an Australian Research Council Discovery grant. The second example examines a research team undertaking research on innovation and emerging technologies in the construction industry, as part of an initiative called the National Science Challenge in New Zealand. Based upon our research experiences we consider what it means for anthropologists, sociologists, scientists, engineers and feminist scholars to have worked together. We also highlight the central role communication plays in conveying science to the public and other researchers, and

the duty of care to research participants to know what to say, how to say it, and what not to say. We outline difficulties in how research data can used in dissemination and the different ways research must speak to competing audiences such as academia, industry and government. Reflecting on our transdisciplinary research experiences, we seek to highlight the opportunities, challenges and reality of collaboration in order to create meaningful change in the world and outline some strategies to help other researchers engage in transdisciplinary research.

Co-Production And Consensus: Doing Ethnography In a Collaborative Research Partnership *Victoria Loblay, Menzies Centre for Health Policy, The Australian Prevention Partnership Centre; Katie Conte, Menzies Centre for Health Policy, The Australian Prevention Partnership Centre; Sisse Groen, Menzies Centre for Health Policy, The Australian Prevention Partnership Centre; Amanda Green, NSW Office of Preventive Health; Christine Innes-Hughes, NSW Office of Preventive Health; Andrew Milat, Centre for Epidemiology and Evidence; Lina Persson, Centre for Epidemiology and Evidence; Mandy Williams, South Western Sydney Local Health District; Sarah Thackway, Centre for Epidemiology and Evidence; Jo Mitchell, Centre for Population Health; Penny Hawe, Menzies Centre for Health Policy, The Australian Prevention Partnership Centre*

Collaborative research partnerships between researchers and policy-makers aim to improve the availability and quality of research evidence to policy makers. Through research co-production processes, partnership research brings together professionals with a range of disciplinary and policy backgrounds underpinned by different forms of expert knowledge and professional identities. This presentation discusses our experience working in a collaborative research partnership comprised of state-level administrators and policy-makers, representatives from local health districts, as well as a transdisciplinary team of university-based researchers. The partnership team is enabled by the NHMRC Australian Prevention Partnership Centre, which takes a systems approach to chronic disease prevention. We are studying the largest ever scale-up of primary school and early childhood service obesity prevention programs in Australia through conducting a multi-sited ethnography of an electronic monitoring system known as Population Health Information Management System across local health districts in NSW. In exploring what makes research collaborations effective, productive and satisfying programmes for all participants, we discuss some of the co-production strategies that have facilitated consensus among the group and consider why they have been effective. We highlight the importance of defining key policy concepts through collective conceptual work. We also consider some of the challenges that have emerged when mediating divergent understandings of the research data and how they have shaped our project as it has proceeded. We argue that in order to create meaningful change through collaborative research partnerships, the process of co-production and the co-creation of knowledge through STS practice must be described and interrogated as part of the overall research study methodology.

Re-configuring relationships and practice for sustainable change *Virginia Baker, ESR Institute of Environmental Science &*

Research Ltd; James Ataria, NZ

Transdisciplinary approaches explicitly orient science to support 'real-world' challenges and change for sustainability. Yet, globally and locally, the scale and impacts of the 'wicked problems' confronting us continue to increase. In practice, success can be limited and fraught with challenges arising from power relations and values embedded in western science-policy settings. For example, whilst project teams may embrace a transdisciplinary orientation, the wider institutional settings for science, policy, community engagement and environmental education tend to harbour linear and instrumentalist trajectories. Knowledge uptake, new technological fixes, economic rationalism, consumer choice and behaviour change models remain as latent but firm defaults. This paper examines strategies for social scientists to negotiate the challenges of building transformative change at the intersection of old and new science research paradigms. Our insights from ongoing transdisciplinary research to reduce the impacts of human-generated waste on the environment highlight the centrality of indigenous partners and worldviews in anchoring conversations and building trajectories for sustainable change. Aotearoa/New Zealand's post-Treaty settlement socio-political landscape offers very different power-bases from which to galvanise change, as well as strong dialogic processes for knowledge building, sharing and collective learning. Multi-stakeholder planning, systems thinking, systemic intervention, STS and social practice theory are useful transdisciplinary tools for co-inquiry and knowledge co-creation. Negotiated within indigenous partnerships, these collaborative planning approaches help coalesce tactical alliances, shared goals, values and priorities for multi-scaled, multi-pronged sustainable solutions. Importantly indigenous partnerships, processes and understandings are fundamental in anchoring deeper reflective practice and re-working paradigms and possibilities for meaningful sustainable change.

Understanding the Emergence of a Hybrid Knowledge Production Discourse: The Case of the Generation Challenge Programme (GCP) Drought Tolerant Rice Research in India *Soutrik Basu, Institute of Development Studies Kolkata*

The Generation Challenge Programme (GCP) is an international platform for agrarian knowledge production for a complex scientific problem, namely, Drought. The GCP ushered in a new form of knowledge production that reconciles both the upstream laboratorial research and its downstream delivery at the farmer's field. This paper aims at understanding the knowledge production process of the GCP by taking insights from the two paradigms of knowledge-production discourse (Mode 1 and Mode 2), as well as by employing insights from agrarian knowledge production discourses (such as linear and systems paradigms). More precisely, it explores the following three research questions: how three core concepts such as research partnership, transdisciplinary orientation and inclusion of end-user in research and validation manifested within the knowledge production process of the GCP drought-tolerant rice research; what type of knowledge production emerged within the GCP drought-tolerant rice research; and what implications can be discerned for agricultural research and development.

Through a qualitative case study method, this paper explores empirically the case of GCP drought tolerant rice research in the Indian context to elucidate the knowledge production process of GCP to sketch a theoretical as well as a practical position on the agrarian knowledge production discourse. This paper argues that a hybrid knowledge production discourse has emerged within the GCP rice research that has elements from Mode 1 and linear paradigms as well as Mode 2 and systems paradigms. Further, this paper also illustrates the implications of such hybrid knowledge production discourse for agricultural research and development.

Session Organizer:

Casimir MacGregor, BRANZ

Chair:

Casimir MacGregor, BRANZ

100. Decolonising the Deep Past: Archaeological Narratives, Human Origins and Indigeneity

Closed Panels

Traditional (Closed) Panel

9:00 to 10:30 am

ICC: C2.3

Since the 'time revolution' of the nineteenth century, which revealed the immense antiquity of the earth and all life upon it, Australian evidence has played a key role in shaping global debates about human evolution. This panel analyses the narratives about human origins that have defined the past two centuries, from the social Darwinism of the nineteenth century to the ongoing and problematic assumptions about human evolution and modernity in the twenty-first. It explores the ways in which different technologies have been used, and continue to be used, to categorise and stratify human societies over time. The papers also reflect on how the fields of archaeology and palaeoanthropology have transformed in recent decades, with research becoming increasingly concerned with social questions and with a growing number of Indigenous scholars using archaeological techniques to engage with their own heritage. In Australia, perhaps more than anywhere else, knowledge-making about the deep past is inextricably entwined with Indigenous politics. By approaching archaeological research as a socially embedded practice, the speakers demonstrate the relevance of postcolonial/decolonial reflection and critique for understanding deep time historical processes and their interpretation.

Participants:

Lost in translation: stone tool collecting and Tasmanian Aboriginal cultural endurance *Rebe Taylor, University of Tasmania*

On 12 November 1908, English amateur anthropologist Ernest Westlake sailed past the northern coast of Tasmania for the first time, but the beautiful landscape inspired anxiety. Westlake had come to collect Aboriginal tools, but how well was he going to be able to "read" them? Would he be able to translate a (supposedly) "extinct" culture from mute stone tools? From 1908-1910 Westlake travelled by bike, boat, train and foot to 142 sites across Tasmania. He formed what is probably the largest single collection of Tasmanian Aboriginal stone artefacts, now housed in the Pitt Rivers Museum, Oxford. Why? Westlake wanted to prove, by comparison, that artefacts he had excavated in France dating back 100,000 years were human-made. The thesis was part of a wider scholarly project to determine the depth of European antiquity, but it was flawed. Westlake's French artefacts were in fact broken rocks, incomparable to the carefully-made Tasmanian tools. Westlake also returned home with the richest record of Tasmanian Aboriginal language and culture dating from the 20th century in his notebooks; he had talked to many Indigenous people. But he called them 'halfcastes' and presumed they spoke of a lost culture that had once belonged to their parents. Yet, with the guidance of contemporary Tasmanian Aboriginal community members, Westlake's archive can be translated. Then we can see what the collector could not: an enduring and complex Aboriginal culture with a deep past.

The New Old World: global archaeological narratives in late twentieth-century Australia *Billy Griffiths, Deakin University*

Deep time scholars such as Jared Diamond and Steven Mithen place the birth of history at 50,000 years ago. 'Or thereabouts.' This is the time of Diamond's so-called Great Leap Forward, the moment humans went from being a species no more exceptional than 'beavers, bower-birds, and army ants' to becoming 'the first species, in the history of life on Earth, capable of destroying all life'. There was no stark anatomical change to mark this shift; rather, it is suggested, this was an inner event – a revolution within the mind. Why did this happen then? Was it colonisation of the 'new' lands that sparked the change? Was it the development of the modern voice box? Or indeed is this idea of an inner event a misnomer, a 'coming of age' invented by Eurocentric minds obsessed by revolution? This paper explores the ways in which the field of Australian archaeology repeatedly challenged global understandings of human evolution in the late twentieth century. It unpacks the archaeological discoveries, technological innovations and social movements that underpinned these debates, and examines the ways in which scientific ideas about the deep past have reemerged in contemporary Indigenous politics. It argues that in Australia, perhaps more than anywhere else, the deep past is never far from the political present.

Universalism, historical difference, and modern human origins *Martin Porr, University of Western Australia; Jacqueline Matthews, Monash University*

Human origins continue to be one of the most popular themes in archaeology. New findings and discoveries that supposedly 'rewrite the history books' appear in the general news on a regular basis. This contemporary field of study is characterised by the increased use of sophisticated scientific technologies and techniques, and interdisciplinary collaboration between a wide range of natural sciences. However, with this bourgeoning of data available to inform our narratives of human origins, relatively little room has been left for critical theoretical reflection. One of the key issues to be discussed in this paper is that interpretations in this field are still guided by problematic and long-lasting assumptions about the nature of humanity and its past. This paper will critically explore some aspects of recent interpretations of (modern) human origins and will provide several examples to demonstrate the relevance of postcolonial reflection and critique for understanding deep time historical processes and their interpretation. We argue that both the explanans as well as the explanandum in the study of human evolution and origins have been directly and indirectly shaped by the experience of modern European colonialism. In this case, the explanandum is modern human variability or what is constructed as modern humanity and the explanans is

evolutionary theory in its various forms, developed since the mid-19th century. Examples drawn from the experience of colonialism in Australia are particularly relevant for demonstrating the entangled and ongoing political and colonial influences on the production of knowledge in this field.

Session Organizer:
Billy Griffiths, Deakin University
Discussant:
Lynette Russell, Monash University

101. Global Darwin Down Under
Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: C2.4

Darwin is an iconic figure, simultaneously scientific saint, 'global product,' and fundamentalist devil. He has been more studied and written about than any other scientist. The public has a well-rehearsed view of him as the modest, genial young naturalist of the Voyage of the Beagle, collecting the fossils and finches that would lead him to his theory of evolution by natural selection; then as the ageing, isolated genius who revolutionized the biological sciences and the way humans think of themselves. He is pre-eminently media-worthy. We are all too familiar with the proliferation of popularizations, biographies, television programmes, museum exhibitions, websites, and the many celebrations of the anniversaries of his major publications, of his birth and death. Defying the best efforts of postmodernism, this particular author refuses to die. His significance stretches far beyond the industry of specialist Darwin studies, through heated debates in modern evolutionary biology, ethology and anthropology, to public conflicts over religion, gender and race. There are at present more Darwin scholars Down Under than in any country other than Britain and the United States. Here we bring together a representative sampling of the diversity and depth of Australasian-based re-writings of aspects of the field of Darwin studies and their global ramifications. These are re-writings that refract the man and his representations from a different perspective, that challenge stereotypical images and interpretations, that redefine traditional centre-periphery relations, that signify the centrality of Down Under Darwin to Global Darwin.

Participants:

Doing Darwin Down Under: Old Problems, New Challenges
Evelleen Richards, University of Sydney
What was known in the trade as the "Darwin industry" has become what Peter Kjaergaard has christened the "Darwin enterprise", a "multimillion franchise" involving everything from TV programmes, websites, books and teaching materials to exhibitions, cruises, field trips, mugs and t-shirts. Darwin is embraced, appropriated, celebrated, castigated, made easy, made fun of, made money of (on the English £10 note), and, above all, made money from. In what is perhaps the greatest game changer, what once was the preserve of specialist scholars with privileged access to collections and archives is now open to anyone with internet access; the creation of huge online searchable databases of Darwin's correspondence, notes, transcriptions, manuscripts, marginalia, editions, translations, etc. etc., has unleashed a multitude of Do-it-yourself Darwins with a plethora of criss-crossing political, ideological, scientific and religious agendas, to contest the public face and space of Darwinism. Struggles over the definition and control of Darwinism are hardly

new, as the papers in this session remind us. They were in train well before Darwin's death. But the globalization of Darwin presents novel challenges as well as opportunities for professional Darwin scholars, particularly for those of us who do him from Down Under. This paper explores the ways in which the global ubiquity and circulation of knowledge has transformed the antipodean study of Darwin and all things Darwinian, identifies the problems it poses and the responsibilities it imposes, and outlines the opportunities it offers for cultural and disciplinary interactions and dialogue.

Darwin and Recent Biography *James Bradley, School of Historical and Philosophical Studies, University of Melbourne; Roderick Buchanan, History and Philosophy of Science, University of Melbourne*
Biographers have long been urged to use biography as a way of exploring the practice of science and its cultural milieu. Twenty-five years ago, Desmond and Moore's blockbuster Darwin attempted to do just that. Yet their "defiantly social" approach did not define subsequent biographical scholarship as much as many imagined it would. Instead, it appeared to re-moralise appreciations of the man. In the wake of Desmond and Moore's "tormented evolutionist," markedly different Darwins have emerged – from sober and disinterested scientist, to sly and deceitful plagiarist. Broader forces have helped keep Darwin's 'character' in play, not least the general retreat from deterministic sociological accounts in the aftermath of the Science Wars. Moreover, as the twin anniversaries of Darwin's life drew nearer, obligatory reverence was sure to be leavened by dissent. But few scientists have left such a rich legacy and offered the chance to get inside their head quite so readily – an impulse conveniently enabled by rich online resources. It seems that to know Darwin is to know his theory, and vice-versa. Publishers apparently agree. Darwin – devil or saint – still sells, irrespective of the exhausted nature of the resources being drawn on. And yet a paradox remains. Using biography to explore 'character' issues must ignore some persistent problems. Such explorations demand ad hoc methodologies and speculative psychologies that have consistently defied satisfactory articulation. Despite a meta-biographical self-consciousness, the exceptionalism of some recent Darwin scholarship seems nostalgically retrograde. This paper attempts to survey and explain these developments and assess future possibilities.

Charles Darwin, Indigenous People and the 'Mysterious Agency' of Colonisation *Kathleen Butler, University of Newcastle, Indigenous Education and Research*
Many people use Social Darwinism as concept for unpacking the historical belief that Indigenous peoples were destined to die out. What remains unknown to many however is the role that Darwin himself played in the development of the concept on the basis of what he termed a "mysterious agency", where "death seems to pursue the aboriginal (sic)". This paper will briefly explore Darwin's characterisation of Indigenous people, attempting to offer an explanation for the "mystery" of colonisation's decimating effects.

Monkey Business: Darwin, Gender and Management Science *Cordelia Fine, History and Philosophy of Science, University of Melbourne; James Bradley, School of Historical and Philosophical Studies, University of Melbourne*

Darwin's evolutionary theories and their successors have not only had implications for analysing and interpreting human behaviour and human nature, but have also inspired programmes that have sought to intervene in a variety of organisational and institutional contexts. Many (including the great man himself) have turned Darwinian description into Darwinian prescription. Since nineteenth- and early twentieth- century social Darwinism and its eugenic offshoots we have seen consistent attempts to create applied biopolitical programmes, where actors have sought to turn a Darwinian is into a categorical ought. Ultimately, biology has been used as an argument to reconstruct or reform social, economic and cultural regimes – nowhere more so than in the areas of gender and race. In twenty-first century evolutionary psychology, this continues to be a common charge with respect to gender, one that is rightly or wrongly strenuously denied by its practitioners. In this paper, our focus will be on gender. We will explore how Darwinian thinking, widely defined, has been applied within business contexts to reaffirm or challenge hegemonic thinking about gender and power in management science. In particular, we will survey current applications of evolutionary psychology to this field, analysing the intersections of a gendered science with gendered business practices. In the process, we will explore the genealogy of current ideas, referring back to the long history of Darwinian biopolitics applied to the intersection of gender and power within capitalism.

Darwinism: The History of a Contested Concept *Ian Hesketh, Institute for Advanced Studies in the Humanities*

The term Darwinism has had a contested history, though this fact is often hidden behind the unproblematic way in which the term has been used by evolutionists and the historians of science who study them. A favored strategy has been to reduce the meaning of Darwinism to the single mechanism of natural selection, a strategy that was promoted by neo-Darwinians in the second half of the twentieth century following the modern synthesis of evolution with Mendelian genetics. Recent historians of science who promote the notion of a "non-Darwinian Revolution" rely on such a reduction as well by arguing that in the late nineteenth century natural selection was for the most part rejected by most evolutionists in favor of other, non-Darwinian mechanisms and forms of evolution. But Evelleen Richards's important Darwin and the Making of Sexual Selection (2017) shows just how central was Darwin's theory of sexual selection to his system of evolution, a system that relied extensively on contested theories of embryology, breeding choice, and race, thereby adding several layers of complexity to the meaning of Darwinism. This paper therefore seeks to bring some clarity and historical specificity to Darwinism by examining the origins of the use of this term as well as how its meaning changed over time, focusing in particular on the late nineteenth century when evolutionists and other popularisers of science were just grasping what the term might mean as Darwin began writing specifically about human evolution.

Session Organizer:
Evelleen Richards, University of Sydney
Discussants:
Mark S. Micale, University of Illinois, Urbana-Champaign
Ruth Barton, School of Humanities, University of Auckland
Alison Bashford, UNSW Sydney

Paul Griffiths, University of Sydney

102. Innovations in Methods and Theory
Single Paper Submission
Open Panel
9:00 to 10:30 am
ICC: C2.5
Participants:

Mobile Momentum: Conceptualizing the Social and Technological Changes of Mobile Communication *Colin Agur, University of Minnesota*

Drawing on the concept of technological momentum developed by Thomas Hughes, this paper seeks to develop a theoretical framework for understanding the social and technological changes that have arisen (and will continue to arise) with the development and popularization of mass mobile telephony worldwide. The paper has three parts: It begins by outlining the concept of technological momentum and highlighting its use for scholarly understanding of large-scale changes brought about by recent patterns in technological usage; it then focuses on mobile communication and develops the idea of mobile momentum, drawing on a set of episodic empirical studies of mobile usage; finally, the paper uses the idea of mobile momentum to explore questions of authority and power that have emerged and are likely to emerge as mobile communication continues to develop and integrate capabilities from other technologies. The paper seeks to identify the ways that mobile telephony is distinct in debates about technological and social determinism, and the ways that mobile communication can re-ignite a discussion about technological momentum and social change. Both the paper and the presentation are intended as an opportunity for scholars to think conceptually about how to theorize emerging communication technology, especially as it continues to evolve in ways both imagined and unimagined.

Scenarios And Simulations - Methods For Constructing Futures *Joshua Loughman, SFIS - Arizona State University*

Concerns with futures, anticipation, and attending to how complex sociotechnical and knowledge systems change over time are questions at the core of Science and Technology Studies (STS). There are myriad approaches to thinking about these questions originating from diverse disciplines and STS has been a crucial integrator of methods from these perspectives. This research will explore two methods for thinking about complex sociotechnical systems futures. The first is scenario analysis, which is employed in STS scholarship extensively. The second method is quantitative modeling and simulation. This approach is more often the objective of critique from STS scholarship than utilized by it. An analysis of these approaches is illustrated with examples from energy systems research. Both scenario analysis and modeling have long, rich histories in the construction of energy futures, fantasies, and imaginaries. The comparison of the futures imagined by scenarios and models in the energy system highlight an important question central to STS: how are the tools used affecting the kinds of futures produced? Why are the futures arising from each approach different? Finally, STS methods are transdisciplinary and benefit from the fertile cross-pollination with other disciplines and perspectives. Given this, could a protocol synthesizing scenario approaches

and simulation provide an opportunity for improved anticipation of complex sociotechnical systems?

The metamodernist paradigm on STS methodologies *Martin Andrés Perez Comisso, SFIS - Arizona State University*

Research methodologies had a historical tension between quantitative and qualitative approaches. (Hernandez-Sampieri et al., 2010) Both were developed under particular conditions, recognizing quantitative evolution on the modernist paradigm of early XX century and qualitative methodologies in the 60s and 70s postmodernism boom. Both stories constitute part of the research design history and transformation. But, current digital technologies allow new intersections among data that are expanding research practices, disciplines, and knowledge at an accelerating rate. The methodology is a polysemic problem for STS as a field, and this paper looks at cultural tradition and research design history to understand as STS reinforce metamodern practices among academic work. The inclusion of transformative and mixed approaches become popular strategies to address research, especially on interdisciplinary scholars. These works develop the argument to recognizing the metamodernist stance (Turner, 2011) as the base of mixed approach and as a consequence. How could this perspective on research explain the cultural approach embed on classical STS works? (especially such as described by Law in 4th Handbook). The conclusion addresses an explanation of our field methods and its cultural influence, to contextualize on philosophical, historical and technical ways how STS research is a very explicit metamodernist expression on academia.

Does Your Computer Know You Better Than You Do? *AMELIE ANGIE LAURA BERGER SORARUFF, University of Dundee*

What does it mean to "know yourself" today? French thinker Christian Fauré suggested that progress in neurosciences redefined the marketing of new technologies in order to respond to what seems a general and popular concern: getting direct access to our brain. According to Fauré, connected bracelets such as the Apple Watch, capable to calculate heart rate and blood pressure, can be thought as the reactualisation of Foucault's understanding of the ethical principle "know yourself". Drawing on a philosophical background, the paper combines the work of Michel Foucault and Bernard Stiegler. It will be argued that if new technologies know how we function and can anticipate what we need, they fail to acknowledge us as desiring beings. Knowing yourself, in the Foucauldian sense, is less a question of extracting data from your body, than an activity turned towards the cultivation of desire, curiosity and productivity. Agreeing with Foucault, Stiegler's key idea is that human beings constitute and trans-form themselves through technical supports, so that self-knowledge is inevitably mediated by technologies. The main implication is that in being designed to get closer to our brain, new technologies encourages us to think ourselves as a neuronal activity. However, for Stiegler, the human is more than its synapses, it is a being capable to surpass and sublimate its instincts. Human's indeterminacy is what should be preserved for it is precisely what makes us human. The paper wants to think the differences between brain and mind, needs and desire, in relation to the concept of personhood.

Going Longitudinal: Proposed Follow-up of a 1983 Data Set *John McCamy Wilkes, WPI/retired professor*

The purpose of this paper is to look back 35 years, and then forward to explore the potential in a follow up study of the 1221 respondents (1006) native born Americans) in a 1983 comparative sample of Physics, Chemistry, Economics and Sociology undergraduate and graduate students studying in eight of the best ranked departments of their fields located in the Northeastern US. I was co-principal investigator, the project was funded by NSF. The study was my idea, growing out of my dissertation, which was a comparative study of the faculty in 15 of the best ranked departments of this region of the USA. One of the things that makes the student study unique is that it was a gender stratified sample. In short, there are approximately equal number of males and female coming out of the same departments at about the same time and thus into the same job market. I propose a session of about an hour be devoted to a half hour of laying out the rationale,research question, cognitive and social variables list, measures and sample characteristics of the original study. The second half hour would be a) an open ended discussion with the audience members of what might be learned from a followup study or b) Panelists from Sociology, Psychology and either History or Anthropology offering their perspectives on what the intellectual and policy yield of the proposed followup study might be.

Session Organizer:
Colin Agur, University of Minnesota

Chair:
Colin Agur, University of Minnesota

103. Doing Science in Asia: Linkages and Tensions
Papers for Open Panels/Is there such a thing as Asian science?
Open Panel
9:00 to 10:30 am
ICC: C2.6

The papers in this session focus on specific case studies of scientific research in various Asian countries and ask how gender, culture, and developmental stage influence the practice and remuneration of scientific research, and the emergence of new sub-fields of knowledge such as biotechnology in various Asian countries. Several of the papers focus on the nexus of state, science, and market in Asia, and the ways in which boundaries and linkages are contested, redrawn, and sometimes erased.

Participants:

Dead Cat, Live Cat, If Schrodinger's Cat Catches Mice, It's a Good Cat: Organizational Chimerism *Abigail Coplin, Columbia University, Department of Sociology*

"Biotechnology with Chinese characteristics" is a sociotechnical imaginary aiming to create not only novel, distinctly "Chinese" technologies, but also new ethical frameworks, modalities of social order, and constellations of state, science, and market collaboration (Jasanoff and Kim 2015). It centers on a principle of "technological domestication" whereby fears of technologically-induced pollution surrounding genetically modified technology are recast into an opposition to foreign aggressors, be they countries, companies, or individual actors. This paper focuses on how this sociotechnical imaginary spurs the formation of new organizational forms within China's agrobiotechnology sector. I show how solidifying the salience of the Chinese/foreign dichotomy drives not only

substantial organizational isomorphism among state-owned and private firms, but also the emergence of an organizational phenomenon I refer to as "organizational chimerism". "Chimeric" Chinese technology firms concurrently express the characteristics of—and function as—commercial companies and academic laboratories, switching between different identities in a contextually dependent manner like an agentic version of Schrodinger's cat. Maintaining an undefined status enables "organizational chimera" to take on high risk, long term projects of national significance, and maximizes these firms' flexibility vis a vis the state and the market. It thus allows Chinese technology enterprises to negotiate with plural tiers of the government whilst not being tainted by the party-state's legitimacy crises. While much of the scholarship on the biotechnology industry's emergence articulates how divisions between academic science and the market have blurred and moved, I show how these distinctions can essentially be erased by drawing new moral boundaries across other ontological axes.

The Emergence and Development of Cross National Knowledge Sharing: Case Studies of International Collaborative Projects in South Korea *SOO A LEE, Georgia Institute of Technology*

While most studies on international research collaboration have centered on macro-level analysis as well as symmetric partners, this proposed study offers a micro-level comparative analysis of international research collaboration projects between researchers from countries of varying degrees of development. Using the methodologies of document analyses, participant observation and semi-structured interviews in mechanical engineering laboratories in South Korea, which have on-going joint research projects with the United States and Tanzania, this proposed study will discuss national-, institutional-, and individual-level contexts that contributes to the emergence and development of international collaborative projects between the United States and Korea, and Tanzania and Korea. My contemporary and comparative study on international joint research projects between the United States and Korea, and Tanzania and Korea entails a narrative and in-depth analysis derived from science and technology studies (STS) that highlight the importance of understanding socially negotiated aspects of science and technology. The close investigation of laboratories including conferences and meetings of researchers involved in the collaborative projects as well as interviews with collaborators will contribute to identifying the knowledge-sharing process within a black box. In addition, the analysis of participant observation and interviews will show the dynamic aspects of international research collaborations among researchers from countries of varying degrees of development.

Evaluation of the Salary Status of Scientific and Technological Workers in China *Guang Yang, NAIS,CAST; Yanni Wang, National Academy of Innovation Strategy*

Compensation incentives are closely related to the work performance of scientific and technological workers, salary incentive is one of the most important motivators. Based on the survey data of the fourth science and technology workers of China Association for science and technology and the interview data of some scientific and technological workers, this paper analyzes the status

quo of scientific and technological workers compensation system in China, find that：Scientific and technological workers' salary competitiveness is not high, and their satisfaction is not high, Diversified forms of salary(For example, the yearly-salary system, stock / option incentives) are not fully reflected in scientific and technological workers, Performance pay system is not really implemented, performance evaluation unscientific, in particular, the salaries of young Scientific and technological workers are even less optimistic. On this basis, this paper analyzes the deep-seated reasons behind these problems, including China's pay system reform has the hysteresis, the reform of the performance system of public-owned institutions is not well understood, the pay system and related organization building of public institutions are not in place. Finally, the paper puts forward the corresponding countermeasures and suggestions, in order to make the relevant agencies be aware of the remuneration of all scientific and technological workers and provide decision reference for the related policies, and then fully mobilize the enthusiasm of scientific and technological workers to better promote the role of science and technology in social development.

The Language of Gendering: A Feminist Analysis of Gender Strategies Adopted by Women in Science Research Organisations in India *Astha Jaiswal, Central University of Gujarat*

It is known and almost universally acknowledged that globally the presence of women in research fields in science is very low, especially at higher professional levels. It can be generalised that as one moves up the organisational hierarchy the number of women goes on diminishing. This bias, it appears transcends cultures, communities and economies -it is equally present in the US, Europe and even progressive Nordic nations. The purpose of this paper is to study how the perceived experiences of women in Indian science research organisations regarding barriers faced by them could be explained using the theories of gendered organisations (Acker, 1990) and gender strategies(Bird and Rhoton,2011) . Methodologically, the study is based on the life experiences of nine women respondents from different science institutions based in India. The study has used Lightfoot and Davis' (1997) Portraiture methodology to construct in depth narratives based on life experiences of the respondents. Theories of gender organisations (Acker, 1990) and gender strategies (Bird and Rhoton, 2011) to analyse the language of the discourses. Analysis of the discourses produced in the narratives revealed subtle ways in which the respondents engaged in gender strategy practices under combined influence of the gendered organisation and patrifocal cultural context. It was found that gendered nature of discourses produced in the narratives could effectively be explained only by combining theories of gender strategies and gendered organisations, while taking into consideration the patrifocal cultural and social context.

Session Organizer:
Anju Mary Paul, Yale-NUS College

104. A Critical Look into the Classification of Emerging Entities
Papers for Open Panels/A Critical Look into the Classification of Emerging Entities

Open Panel
9:00 to 10:30 am
ICC: E3.10
A novel entity, be it synthetic, genetic or phytochemical, emerges as a result of advances in science and technology. At the level of public policy, the classification of such an entity is considered in the context of existing legal and regulatory categories for the securing of public safety. As both goods and services increasingly travel across national borders, it becomes imperative to understand how classificatory system for such goods and services are formulated and put into practice, and the contradictions that arise as a result. The proposed panel aims to understand and map diverse ways of defining an emerging entity across a range of commodities, as exemplified by shifting boundaries such as food versus drug, medical versus cosmetic interventions, as the new entity comes into contact with regulatory agencies and consumer markets at the national and global levels. Following on a body of literature in STS that examines classificatory systems, the departure point for this panel is the observation that a classificatory system is inevitably interlinked with cultural, historical, social, economic and political circumstances. Sharing research concerns about the ways in which official classifications with regards to food, drugs, and environmental matters have far-reaching consequences in many areas of public life (such as public policies, health food markets, and consumer perceptions), the contributors to this panel are expected to explore questions hinging on shifting boundaries of commodified objects.
Participants:

Labeling in an Emergent Food Category: Informative or Performative? *Tomiko Yamaguchi, International Christian University*

The category of so called "health foods" in Japan includes foods for specified health uses (FoSHU) and food with nutrient function claims; such foods blur the category distinction between foods and drugs. The labels on the products carry information such as the stamp of approval by a regulatory agency along with health claims designed for marketing purposes, such as "fat deposition resistant." So long as the regulatory safety evaluation has been completed, such claims on the label are permitted by the existing regulations. Consumers have somewhat contradictory expectations of health foods: they expect such foods to have drug-like effects, but food-like safety. These observations draw our attention to the professional and organizational activities that lead to the creation of labels. Food labels play a role in the evolution of power relationships between experts and laypeople: where consumers look to food labels for information supposedly provided by experts, marketers use scientific evidence to gain credibility for their messaging and to create particular perceptions of foods. Extending the analytical notion of "regulatory objectivity", which has been used primarily in the analysis of biomedical entities, this presentation addresses the issues that arise around regulation and labeling of an emergent food category as a result of advances in science and technology, a theme that is understudied in STS, with a focus on the collective actions of concerned parties and the contradictions that arise from these actions. The data come primarily from observation at seminars and published reports by science academies and government agencies.

The Herb Pharmaceutical Industry in South Korea *Eunjeong Ma, Pohang University of Science and Technology*

This paper presents an emerging entity of the herbal pharmaceutical industry in South Korea since the 1990s. After analyzing the governmental initiatives to mass-produce herbal medicines, the case of one biotechnology company that produces functional health foods and natural drugs is discussed. Naturalendo Tech (NeT) emerged as an exemplary venture biotechnology company that was acclaimed to excel in translating Korean medicines into novel pharmaceutical products. In 2015, NeT was at the center of public outcry over its market hit, the phytoestrogen product line purportedly containing Cynanchum wilfordii (baek shu oh). It was discovered that this plant was actually not present in the intended consumer health products, but a morphologically similar plant was being used instead. The subsequent public outcry exposed the entangled nature of the industry by posing the following question: How is quality, safety and efficacy of functional foods derived from Korean medicines being assessed and secured? This seemingly straightforward question placed the entire herbal pharmaceutical industry, from sourcing through to regulation and marketing, under intense public scrutiny. This case provides the entry point for analyzing the emergence of the herbal pharmaceutical industry in South Korea, focusing on tensions between globalizing strategies, regulatory regimes and the domestic market. The chapter shows that the industry is best understood as an asymmetric assemblage of post-colonial relations linking domestic and international regulatory authorities, consumer market agencies, techno-scientific research institutions, the academy, and medicinal plants.

Emerging Biomedical Technology and Healthcare System in Developing Economies *Nidhi Singh, Jawaharlal Nehru University*

It is well known that the emerging biomedical technologies have increased the application of biological and physiological sciences to clinical medicine for the betterment of healthcare system and enhanced the opportunities to design easy innovative solutions to various biomedical problems. As an emerging technology, Molecular Diagnostics (MDs) is known to be one of the most promising biomedical technologies for healthcare diagnosis. MDs have revolutionized clinical practices by combining laboratory medicine with the knowledge of molecular genetics, which has shifted the comprehension of the biological system from descriptive to mechanistic. Given the central role of emerging technology in the healthcare sector, the present study examines the issue of adoption and development of MDs an emerging healthcare technology in less income economy such as India. In particular, the context-specific issues that are addressed in the study are (a) the exploration of the characteristics of MDs as an emerging technology in terms of radical novelty, relative fast growth, technological coherence, prominent impact, uncertainty and ambiguity and (b) the issues and challenges of introduction of new and emerging technologies within the medical diagnostics sector in India. This will cover the challenges of indigenization, adoption and absorption of imported diagnostics, institutional and organisational interaction for the introduction of new technologies for resource constraint healthcare settings, technological co-dependencies persisting in radical emerging healthcare technologies involving multiple technologies and formulation of longer-term policy strategies.

Session Organizer:
Tomiko Yamaguchi, International Christian University
Chair:
Eunjeong Ma, Pohang University of Science and Technology

105. Carson Book Prize for "Life Support: Biocapital and the New History of Outsourced Labor" by Kalindi Vora: Author Meets Critic
Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: E3.2
This panel discusses and expands on Kalindi Vora's 2018 Carson Prize winning book "Life Support: Biocapital and the New History of Outsourced Labor (University of Minnesota Press, 2015)". Life Support is a compelling multi-sited ethnography that analyzes call centers, IT outsourcing and gestational surrogacy in India as a kindred forms of outsourced vital labor. Over the course of the book, Vora draws these disparate cases together in surprising and productive ways, where each highlights less visible aspects of the other. The result is a work that brings new ethical and political insights to each case, as well as to broader discussions of biocapital and labor.
Participants:
Chia-Ling Wu *Chia-Ling Wu, National Taiwan University*
Chia-Ling Wu
Kaushik Sunder Rajan *Kaushik Sunder Rajan, University of Chicago*
Kaushik Sunder Rajan
Shobita Parthasarathy *Shobita Parthasarathy, University of Michigan*
Shobita Parthasarathy
Session Organizer:
Timothy Choy, University of California, Davis
Chair:
Sara Wylie, Northeastern University
Discussant:
Kalindi Vora, University of California San Diego

106. Personhood, Law, and Relationality Amidst the New Biosciences I
Papers for Open Panels/Personhood, law and relationality amidst the new biosciences
Open Panel
9:00 to 10:30 am
ICC: E3.3
The 21st century is witnessing a profound transformation in law and society because of the implications of the new biosciences and biotechnologies. New technologies are emerging that radically challenge our conceptions of nature and law and that demand new tools in the humanities and social sciences to adequately respond and analyze these practices. This panel starts with the premise that these developments provide novel opportunities to thinking anew about the nature and structure of personhood and relationality. Bioscientific advances in the field of postgenomics, neuroscience, research on the microbiome, and immunology are encouraging thought provoking problems for the foundational cultural and legal principles of personality as well as their attendant notion of personal rights. Complex issues arise in the intersection of law, biology, and society, and the panel aims to explore these problems of what can be called emerging issues in "biolegality"—the coming together of biology and legality—and to revisit the concept of personhood in posthuman and relational ways.
Participants:

Kins, Chimeras, Controversies: The Challenges of Public Debate and Engagement over Interspecies Id/entities *Myra Cheng*
In September 2014, the National Institutes of Health imposed a temporary ban on federal funding for what has been termed 'chimera research.' The objectives of such research include disease modelling, stem cell testing and the production of animals with human organs. Some commentators welcomed the announcement. Bioethicist and law academic, Hank Greely, expressed concern that chimera research could endow laboratory animals with 'human consciousness.' Similarly, philosopher, David Resnick, commented, 'The prospect of an intelligent mouse, stuck in a lab screaming "I want to get out!" is very troubling to people. There is psychic suffering, not just physical suffering.' In response, advocates of chimera research dismissed such concerns as unfounded. In a letter published in Science, a group of scientists and bioethicists from Stanford University called upon the NIH to lift its ban as soon as possible. They argued that the temporary withdrawal of federal funding 'casts a shadow of negativity towards all chimerism studies' and threatens scientific progress in key areas of biomedical research (Sharma et al 2015, 640). Though the exchange between Resnick and Sharma et al is interesting and entertaining for the public to observe, scholars in science and the humanities will likely agree that the way in which the conversation has unfolded is not amenable to open and inclusive dialogue. As such, in this paper, I offer an alternative perspective by posing a different question raised by chimera research, that is, what constitutes the limits of the human? My paper illustrates the significance of this question with three case studies from Australia and the US. My case studies show that whether we are dealing with human tissue, animal organs or chimeric entities, social movements and interest groups have consistently taken effective action to contest and influence the trajectory of science and/or the regulation of biomedical research.

Where is the genomic person? biolegal platforms, boundaries, unmoored persons *Samuel Taylor-Alexander, Monash University*
Genomic sequencing technologies have seen forms of molecularization and datafication emerge in which the body is unbound from biology and exists simultaneously in different formats and locations around the globe. In this paper, I look at constructions of personhood contained in the biolegal platforms that govern this data. I draw on ethnographic research on genomics in the UK and Australia, including my experience co-authoring legal case comments, to examine how the conjugation of law and life sciences is changing what we call "body". This conjugation has given way to new concerns surrounding privacy, autonomy, and ownership. I examine how biolegal platforms seek to mitigate these concerns while making meaningful genomic data. Building on Combrosio and Keating's articulation of 'biomedical platforms' – assemblages of experts, standards, protocols and programmes that allow for the instrumentalisation of medical knowledge – I demonstrate that law is increasingly becoming part of the bench in dry biology. I show how these platforms (1) contain techniques of hiding and making visible, (2) are built on infrastructures and data-exchanges that store and move data, and strip

identity from genomic persons, and (3) contain new assumptions about personhood. I suggest that asking where the genomic person is provides insights into how personhood is imagined and constructed today.

Can Nonhuman Author? Challenges for Anthropocentric Copyright Laws *Shun-Ling Chen, Institutum Iurisprudentiae, Academia Sinica*

Copyright law grants authorship and ownership to authors for their works of originality. Current copyright systems generally only permit a human person to author a work, arguing that only humans are capable of relevant intelligence and creativity. With the rise of artificial intelligence (AI), computers are capable of learning and produce works on its own, demonstrating that creativity is not unique to human. (Boden, 2009) In fact, the originality requirement in copyright law is so low that can be easily sufficed by computers or animals (e.g. the "Monkey-selfie dispute that began in 2014). Why, then, do we limit authors in copyright law to natural persons, and treat both animals and computers simply as tools assisting human actors' execution, even though human actors do not necessarily have full control over the final product, or even the ability to envision the actual outcome? Discussions about AI and copyright law tend to dismiss the possibility of nonhuman authors altogether, and the question quickly became only about incentivizing human actors and allocating property interests among them, i.e. whether the end users, programmers, or their employers (although ironically are often legal persons) deserve to claim authorship and/or ownership of the work. This study discusses what differs animals and AI from a natural person in the process of producing new copyrightable works, and asks when, and to what extent can nonhuman claim ownership. The deeper philosophical question is the entanglements between human and nonhuman (Haraway, 2016), and whether nonhuman can be part of the human moral community.

Midata.coop And The Transactional Legalities Of Precision Medicine *Declan Liam Kuch, UNSW; Georgia Miller, UNSW; Matthew Kearnes, Environmental Humanities Progarmme, School of Humanities and Languages, University of New South Wale*

The informational turn in the biosciences has brought forth extraordinary rhetoric about the capacity of digital devices to govern the health of individuals and populations. Cloud computing, smart watches, and tiny genomic screening machines will allow us to monitor and control chronic conditions, modulate the immune system against a range of disease and isolate abnormal genes, preventing death or illness. This paper examines how critics of this umbrella of approaches known as 'precision medicine' have responded to such rhetoric with concerns over the ownership of health and -omic data. Such critics have instead proposed collective ownership over health data as an antidote to the 'digital feudalism' of Google, Apple and Microsoft. This paper offers reflections on my experience developing the Midata cooperative model in conjunction with several such critics based in Switzerland. I discuss how I am attempting to translate the model to Australia through action research, and reflect upon the implicit subjects of precision medicine – individual, population, corporation and regulator. I reflect upon how the cooperative legal form offers critical perspectives on each of these subjects. I situate data

cooperatives in a range of strategies to politicize the infrastructure of precision medicine.

'The proof is in my chromosomes': Translating radiation exposure into legal liability and state culpability. *Catherine Trundle, Victoria University of Wellington*

This paper engages with the question of proof in medical, bureaucratic and legal settings. Ethnographically it explores the quest for governmental compensation and health care made by UK and New Zealand military veterans of the British nuclear testing programme. In 2005 a cytogenetic study showed that New Zealand test veterans had a significantly higher rate of chromosomal abnormality (translocations) compared with a control sample. The study's authors and test veterans argued that this provided conclusive proof of the veterans' radiation exposure and the continued risk this posed to their health. I begin by exploring how the study shifted the ways in which test veterans conceived of themselves as individuals and as a collective through the lens of molecular personhood, which in turn transformed how they understood and approached illness, the law and the state. I then utilise the concept of translation to follow the study's reception and evaluation in courts of law, governmental expert committees, and in policy settings. I argue that the study findings failed to translate into effective proof for the veterans because of distinct and competing conceptions of state liability, individual rights and personal responsibilities, un/acceptable risk and even the very concept of illness itself.

Session Organizer:
Sonja Van Wichelen, University of Sydney
Chair:
Marc De Leeuw, The Universityof New South Wales
Discussant:
Torsten Heinemann, RWTH Aachen University

107. Science and Technology Studies on Transnational Complementary and Alternative Medicine (CAM)
Papers for Open Panels/Science and Technology Studies on Transnational Complementary and Alternative Medicine (CAM)
Open Panel
9:00 to 10:30 am
ICC: E3.4
CAM has not only become more popular and frequently used in western societies, it has also become a key topic in the sociology of health and illness. The main focus has been on individual use of CAM and on various aspects of professionalization and integration of CAM in conventional health care. As the concept itself indicates, CAM is almost always discussed and interpreted in contrast to conventional medicine and established science. Moreover, the focus on CAM in the west has downplayed its transnational character. It is framed as Other in relation to a 'western' biomedicine, with little exploration of the ways that both systems constitute knowledges and practices that move and are continually transformed through their translation in different geographic contexts, and through their relation to each other. This track aims to move beyond these dichotomies and to explore CAM from STS perspectives. For example, how can we understand aspects of knowledge production, professionalization, standardization, globalization, and integration of CAM – if focusing on material practices, hybridity, actor networks, or boundary work? How is the movement and glocalisation of CAM implicated in transnational knowledge exchange? The track will seek to bring together scholars working on CAM in a wide range

of national settings to foster a transnational STS approach to CAM. Participants:

'A Love That Dares Not Speak Its Name': How is Psychotherapy Discursively Constructed in Australia ? *Tim Johnson-Newell, University of Wollongong*

The professional status of psychotherapy, and the way its various national organizations represent their practices varies across different socio-medical jurisdictions around the world. This variability reflects professional responses to satisfy the requirements of governments and insurance companies. They require 'treatments' within different national 'civic epistemologies' (Jasanoff). Add to this the pressures of 'boundary work' (Gieryn) when the field is viewed from the perspective of dominant evidence based medical discourses (Timmermans and Berg). The variability is then further amplified as psychotherapists deal with ambiguities that appear to be embedded in their practices. The main one being, is the term 'cure' applicable and is it one of the many theories or the person of the therapist that is responsible (Lambert, Wampold)? The following presentation will analyse the situation in Australia where recent government initiatives have added to Medicare, which now includes treatments for mental health care by non-medical practitioners (as set out and reported on by Senate committees between 2006 and 2011). These initiatives have thrown into bas relief the becalming conundrums and paradoxes inherent within the practice and regulation of the psycho-professional field world wide (King, Totton, Postle). The account provided will be a highly reflexive one (Ashmore) drawing on my 'participant observations' as a practising psychotherapist. What emerges is a complex and sociologically ambivalent narrative (Merton) where, ironically perhaps, psychotherapists as dispensers of the 'talking cure' find they dare not speak about what they actually do.

Modernity and Hybridity: Regulation and Anarcho-Herbalism *Nayeli Urquiza, University of Kent*

Anarcho-herbalist and radical herbalist groups in the UK may have a marginal position vis-à-vis the expansion of regulation in the 21st century through voluntary registers. Radical herbalists and other CAM practices, such as flower essences, believe in that healing potential in plants will not work unless it is driven by a sustainable, non-industrialised, self-help centred approach. The history of medicine shows the depth of similar epistemologies of healing, constantly being translated, transmogrified, and pinned down momentarily in the kaleidoscope of CAM therapies. Critics describe them as 'nostalgic', 'naïve' or 'anti-modernist' positions who disregard the risks inherent in plants studied in pharmacological research, and mock them for believing in the 'power', 'essence' or 'spirit' in plants. Focused on preventing the risk of harm posed by industrialised phytotherapy, regulators and/or policy-makers fail to apprehend plants' 'vibrant matter'(Bennet, 2009) in the same way radical herbalists do. Drawing on STS and feminist/plant philosophies, this paper suggests that the law fails to capture the therapeutic value embedded in the messy human-plant relations embraced by radical herbalists. Instead of being understood as future-oriented onto-epistemologies (Barad,2007) that revitalise and regenerate plant-human hybridity (Marder 2014), legal discourse tends to dismiss anarcho-herbalists because they are seen as idealising a kind of pre-modern nostalgia- a fleeting affect arising

from the 'disenchantment' with modernity (Weber 2007).

Publication activity in complementary and alternative medicine revisited, 1966-2016 *Jenny-Ann Brodin Danell, Umeå university, Department of Sociology; Pia Vuolanto, University of Tampere Research Centre for Knowledge, Science, Technology and Innovation Studies; Rickard Danell, Department of Sociology, Umeå University*

In this paper we analyse how research on complementary and alternative medicine (CAM) has developed as a global research domain. We map this development with bibliometric methods. To a large extent this is a follow up to our study published in 2009, where we identified a relatively rapid increase in publication of CAM articles in the late 1990s. We also argued that the expansion of CAM research not only was due to the establishment of specialized CAM journals, but that CAM research had entered into conventional medical forums. But what has happened after that? Has CAM research continued to expand – and what has happened to the content of the research? Empirically this paper is based on the Pubmed database, 1966-2016. CAM is defined as Complementary Therapies according to Medical Subject Headings/major topic. Our results indicate that the number of CAM publications has stabilized at about 4-5000 per year, but that their/its share of all articles in the database has dropped to a small extent. The largest subfields are still Acupuncture, Mind Body Therapies, Musculoskeletal Manipulations, and Spiritual therapies, and the research has become even more clinically oriented over the years, although very few clinical trials are classified according to the clinical trial phase. The most frequent journals in the domain have a clear focus on CAM, and we note a drop in the share of articles published in core clinical journals. These findings signal that CAM is gradually establishing itself as a separate domain rather than breaking into the arena of biomedical research.

Transnational Chinese Medicine: How Academic Chinese Medicine is Configured in Australian and UK Universities *Caragh Brosnan, University of Newcastle, Australia*

Chinese medicine has begun to receive significant attention in STS, where the hybrid, syncretic nature of Chinese medical knowledge and practice has been described, particularly in its relationship to biomedicine. Zhan (2009) has highlighted the 'worlding' of Chinese medicine (CM) as it is continually made and transformed through transnational encounters. This paper builds on this body of work by exploring the dynamics of CM's 'worlding' in locations that have received little attention to date: university departments of Chinese medicine in Australia and the UK. Through interviews with 17 CM academics in these two countries, and observation of teaching in two CM degree programs, the paper examines the various forms that CM takes in these settings, including in relation to bioscience and processes of knowledge-production. Comparative analysis across different sites reveals some of the historical, political and structural factors that produce particular kinds of CM in particular times and places. Emerging among these factors are cooperative arrangements between Australian and UK researchers and universities and Chinese institutions - links that have proved beneficial to those involved, in the context of global flows of scientific and economic capital. Indeed, where the relationship with China is weaker, so seems to be the position of CM within the university. The

paper sheds light on how academic CM in Australia and the UK is configured through both local university structures and wider transnational relationships.

Session Organizer:

Jenny-Ann Brodin Danell, Umeå university, Department of Sociology

108. Mixing and Matching: Interdisciplinarities, Case Studies and Emergence

Single Paper Submission
Open Panel
9:00 to 10:30 am
ICC: E3.5
Participants:

Investigating Evolving Current Practices with Mixing Quantitative with Qualitative Methods *ANN JUDITH MORRISON, University of Southern Queensland; Jacki Liddle, The University of Queensland; Sabiha Ghellal, University of Applied Science Stuttgart*

We organized a workshop, "Mixing Quantitative with Qualitative Methods" as part of the larger OzCHI 2017 conference (Morrison, Viller, Heck, & Davis, 2017), as we had found a lack of understanding of the rigor involved where both quantitative and qualitative methods were used in studies. In addition, adapting methods to include streams of physiological data raised issues with establishing and verifying new procedures and methods. In the workshop, we discussed particulars of the five case studies as presented by the participants and together outlined some of the challenges involved in the study design and analysis processes. The abstracts and presentations of the studies are available at the workshops website (1). Applying mixed methods, while gathering information from rich and diverse qualitative and/or quantitative data sources comes with multiple challenges. We found a collective approach was beneficial. Discussions from the workshop identified three main issues. Study design and analysis, communication and dissemination of results as well as the role of researchers in a study were key, especially when conducting diverse case studies. (1) https://methodshci.wordpress.com Morrison, A., Viller, S., Heck, T., & Davis, K. (2017). Mixing quantitative with qualitative methods: current practices in designing experiments, gathering data and analysis with mixed methods reporting. In Proceedings of the 29th Australian Conference on Computer-Human Interaction (OzCHI'17) (pp. 654–655). New York, NY, USA: ACM, doi: 10.1145/3152771.3156195

What is scientific proof? --- A new workshop-style class for graduate students *Tsuyoshi HONDOU, Tohoku University*

Understanding of ambiguity of "scientific proof" is indispensable for responsible research and for public commitment on scientific issues. However, educational model has not been established for its difficulty. The author has developed and managed the lab class "What are the limits of validity in science?" for freshmen of both science and humanities students over 10 years (2,000 students a year; Lat. Am. J. Phys. Educ. 2011) . With this experience, the author started a workshop-style class for graduate students, which targets the ambiguity of scientific proof in order to relativize scientific knowledge. In the class, a facilitator asks students the criteria of submitting the research result to journals (Validation-boundary, Fujigaki 1998), as they consider they submit papers after getting scientific proof. As students come from several fields, biology, chemistry, physics, geology, mathematics, etc. the criteria each student supposes widely differ. The facilitator positively utilizes the difference among them, and asks them why the ambiguity emerges. The method works well and participating students are increasing, as the questions attract students. The workshop-style class serves a method that enables students to detect the ambiguity of validation-boundary by observation of various answers among students themselves. As the method starts discussion with purely scientific problem, students get involved smoothly. After finding the ambiguity, students can easily notice and consider STS issues which come out of the ambiguity. The author wishes to share this experience with 4S colleagues, and discuss the necessary conditions for participants and a facilitator, to make the method work.

Philosophy of Science Meets STS: A Combined Science-as-practice Perspective on Interdisciplinarity *Miles MacLeod, University of Twente; Martina Merz, Universität Klagenfurt, Austria*

Interdisciplinary (ID) scholarly practice takes a wide range of forms; it brings together and processes heterogeneous elements (concepts and methods, institutional practices and norms; policy-based incentives and administrative interests etc); it has an open, contingent and often contested character; it relies on an ongoing negotiation of interests, standards and responsibilities. This paper advances the thesis that an in-depth analysis of ID science will benefit considerably from a combined science-as-practice perspective which considers all relevant factors whether cognitive (methodological) or institutional equally in order to best characterize what is happening in ID contexts. The called for empirical approach (cf. e.g. Wagenknecht et al. 2015) is a central ingredient of the science-as-practice perspective that has gained considerable traction in the studies of science, be it of philosophical, historical or social scientific orientation, over the last decades. Indeed in more recent years, the so-called practice turn has moved to the center of a renewed dialogue between philosophy of science and its counterpart in the social sciences (cf. Soler et al. 2014). It is in this - often difficult - boundary area that this contribution is located. The paper will document characteristic features of ID research as made visible within a science-as-practice perspective, outlining an integrated methodological perspective that combines selected sensitivities and interests of philosophy of science and the social studies of science. The text concludes with a summary of the proposed approach's benefits and an outline of a research agenda. Soler, L., Zwart, S., Lynch, M., & Israel-Jost, V. (Eds.). (2014). Science after the practice turn in the philosophy, history, and social studies of science (Vol. 14). Routledge. Wagenknecht, S., Nersessian, N. J., & Andersen, H. (Eds.) (2015). Empirical Philosophy of Science (Springer.

Session Organizer:

ANN JUDITH MORRISON, University of Southern Queensland

Chair:

ANN JUDITH MORRISON, University of Southern Queensland

109. Platform Practices and Predictive Seeing 1

Papers for Open Panels/Platform Practices and Predictive Seeing

Open Panel
9:00 to 10:30 am
ICC: E3.6

Large image collections ranging from Sloan Sky Survey, through to ImageNet play a vital role in contemporary economies of knowledge. Yet actual image practices, operations and techniques pertaining to such collections remain relatively occluded. How do data-oriented visual cultures also re-organise 'seeing' in the light of prediction? This panel invites contributions dealing with routine, habitual and everyday data practices that have developed in relation to large image collections in contemporary sciences, industry, media, government and cultural institutions. We welcome research working with or analysing image-sets in their predictive transformations across these domains. Here contributions might address how the formatting and processing of images collections and streams – for border control facial recognition, discrimination of objects in robotic manufacture, earth system observation, smart city urban infrastructure and so on – create the material conditions for predictive models. Everyday data practices concerned with collecting, archiving, ordering or moving through image collections or images streams would be relevant topics. How do STS concepts of knowledge infrastructure, platform, centre of calculation, algorithm or large technical system help us understand changes in the operational role of images in prediction, whether, for example, in earth science or social network media? Re-conceptualisation of ontologies of seeing, image, data, model, prediction and knowledge are important to the aims of the panel. The panel aims to support conversation traversing some of the different disciplinary approaches coming from media and cultural studies, art-design and STS to this topic.

Participants:

Accuracy for Carbon: Visualizing and Financializing Forest Life *Cindy Lin, University of Michigan, School of Information*

In 2011, following attempts to pursue growth in a 'low-carbon economy', Indonesia's Ministry of Forestry and Ministry of Environment compared maps of primary forests to calculate areas eligible for a carbon financing scheme. The maps showed forest boundaries that did not match, stirring uncertainty about the accuracy of earth observatory systems and mapping technologies in Indonesia. Repeated accusations of inaccuracy prompted President Joko Widodo (2014 –) to implement One Map Policy in 2016, an integrated "super databank for all of Indonesia's spatial data". The spatial data will be presented in ways that enable carbon investors to track changes of forest cover over time, accompanied by hypothetical scenarios of how forests might increase or decrease according to political and economic shifts. Models of forests' future states will also enable the difference between a scenario and the observed amount of carbon to be sold and traded on financial platforms. In effect, an accurate map today underpins a plausible carbon trade on the ground, providing information to carbon investors to calculate risk and reward at a distance. But just how is the accuracy of a forest map known, especially one that is patterned to give rise to market action? My paper is an ethnographic study of how maps and attendant visualizations prefigure the development of carbon markets. I ask, what do data visualizations tell us about dominant modes of observation and claims to accuracy? How does what one see and measure become models for such visualizations in their very design and built?

Automated Capitalism and the Aesthetics, Epistemology and Politics of the Chart *Liam Magee, Institute for Culture & Society, Western Sydney University; Ned Rossiter, University of Western Sydney*

The chart is a technology of calculation and decision predicated on the logic of inference and association. Far more advanced in terms of operationality in the finance sector than equivalents in the smart city, the dashboard is exemplary as a set of technical indicators that simulates in truncated form the world as externality. With origins in the 18th century Japanese rice derivatives market, candlestick charts are still widely used today in day-trading and futures markets. More abstracted measures of price movements, based on moving averages and standard deviations, drive decisions to buy and sell commodities. Automated capitalism is underscored by chart-reading humans and data-reading machines involved in a tussle of predicting and profiting from other predictions, further devolving markets from actual economies of labour and production. Against this backdrop, this paper examines the history and epistemology of the chart as a predictive technology in urban design and finance capitalism. We consider the current migration of charting techniques into highly iterated machine learning platforms, largely homologous in their functioning with facial recognition, object identification and image processing systems. The ultimate reliance of such systems upon statistical induction points also toward their epistemic limits. Is abduction - championed by Pasquinelli and Peirce before him - the conceptual move that for now remains incomputable? Or might induction-at-scale eventually generate probability estimates of the unforeseen - market crashes, metaphorical leaps, theoretical novelty? At the core of this paper is an interest in the vulnerabilities of prediction and political surveillance entailed within the limits of capital accumulation.

Every Image An Eigenimage *Anna Munster, University of New South Wales*

The practice and concept of the 'eigenface' has played a major role in allowing a 'system' of facial recognition to become operative. During the 1990s, cognitive science researchers stabilised a face image that was compositionally centred, illuminated to distinguish background from foreground, standardised in terms of image dimensions and ideally set against some kind of constrained background environment such as an office or domestic space. These material and aesthetic constraints on face images allowed templatised faces to become the images upon which facial recognition data sets were then trained. This paper argues that such practices of training constitute the ontogenetic conditions for the production of a visual culture now committed to training all images. The eigenface has become an operation enabling the ongoing production of eigenimages. The eigenimage demands that any image belonging to a data collection must be trained as and alongside its eigenimage. A kind of pre-emptive prediction develops in which there are only ever eigenimage s and modes of imaging. Take style transfer, any image recognition task, or more sinister forms of securitisation based on facial recognition, for example. This paper will also inquire into the ways in which training in deep learning image recognition examples also breaks down, and the eigenimage becomes a deformation. Does this allow novel image production or are these

simply reincorporated into eigenimaging?

Patterns of Life and Predictive Killing: Image Processes, Drone Strikes and Death by Algorithm *Michael Richardson*

While popular imaginaries of American drone warfare tend to rest on the notion of the precise killing of individually identified targets, these "personality strikes" are much less common than their counterpart, the "signature strike." Signature strikes depend on "patter of life analysis" (Gregory 2011, Chamayou 2013), which seeks to detect sustained anomalies of behaviour in daily rhythms and activities in order to identify the 'signature' of an enemy - or, crucially, an enemy to be (Pugliese 2013, Shaw 2016). This process of converting life into data and data into death depends on a complex assemblage of remote sensing, algorithmic processing, data storage, image analysis and human-computer interaction. Within this radical transformation of life into death, there is no necessity that the target undertake any specific violent or threatening action. Operationalising the ontopower of preemptive war (Massumi 2015), the very purpose of the process is to cut off the threat before it arrives. Prediction is what links the drone's capacity to perceive and its power: signature strikes are predictive killing, derived via the collection, processing and analysis of images. This paper examines the socio-technical apparatuses of drone vision, telescoping in scale from analysis of singular images to the networked infrastructures and secure databanks that make predictive killing possible. In doing so, it deploys cultural studies methodologies grounded in the study of affect, aesthetics and assemblages to illuminate practices, processes and fractures that bind together bodies and images in determinations of life and death in drone warfare.

Refined Algorithm Vs. Vulgar Image: Disassemble the Representations of Chinese Working-class Youths Through Online Platform *Jiaxi Hou, University of Tokyo*

The video-clip sharing application Kwai is among the most popular mobile applications in China with over 400 million users, and a large proportion of them are consisted of young working-class users. Regarded as the platform first commonly accepted and shared by Chinese working-class youths, Kwai is always criticized by the public for the emphasis of displaying vulgar visual representations generated by users themselves. However, on the other hand, the platform claims that its "objective" algorithm is an accurate representation of the structure of Chinese young population, and the affordance of the platform is only "technical" and "value free" in the user-generated content. Therefore, using a combined method of online ethnography data crawling, the study aims to investigate how working-class youths represent themselves visually on this platform, and how the affordance of the platform infiltrates into the process. Arguing that both human and non-human actors are incorporated into the emerging assemblage of the visual representation of Chinese working-class youths, the study aims at providing another chance to reflect on the intricately mutual relationships among the developing media technology, the cultural artifacts, the identities of netizens, and the social contexts.

Session Organizers:
Adrian Mackenzie, Lancaster University
Anna Munster, University of New South Wales
Chair:
Adrian Mackenzie, Lancaster University

110. Translating The History Of Science Across Cultures: Cases From 1600-1900
Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: E3.8

Histories of colonial science maintain a narrative of scientific heroism in which the explorer-scientist imports scientific methods to a site of research, using local information, resources, and people to support the colonial endeavour. This colonial historiography celebrates scientific heroes and inventors, the erasure of indigenous narratives, and the cultivation of center-focused paradigms. As such, the history of western science perpetuates a narrative of colonialization in its presentation and erasure of indigenous narratives. This narration co-opts the eradication of marginalised voices and makes even modern history of science a participant in the colonial politics of the historical subject. This panel proposes to analyse structures of science in the context of racial, gender, and colonial politics, leading us to include the epistemologies and sources of the indigenous and marginalised actors who otherwise are excluded from credit. The papers in our panel show that the older models of nation-state centered science are inadequate for historical accounts of science, particularly failing to account for indigenous politics and representation. This panel explores both the historiography of colonial science within its own narratives as well as translations of western science into the vernacular. The five papers presented here explore cases in French, Spanish, Dutch and British colonial science from the seventeenth through the nineteenth centuries, addressing the meeting, adaptation, and translation of local and imperial knowledge in the colony. We show that STS contributions to history of science can radically shape future historiographies, by drawing attention to the transactions and translations necessarily involved in colonial science.

Participants:

Indefatigable Azara: A Spanish Naturalist In South America *Anna Toledano, Stanford University*

Félix de Azara was born on May 18, 1742 in the little municipality of Barbuñales in Huesca, Aragon, Spain. A civil engineer in the Spanish army by training, Azara embarked in 1781 on the state-sponsored mission to survey the new territories of Paraguay. The goal of his journey was to establish a fixed international boundary with Portugal of more than one thousand miles extending down from Bolivia all the way toward the eastern coast near the Río de la Plata. Unlucky Azara soon realized that the army had sent him on a fool's errand. When it became obvious that the Portuguese would never arrive, he decided to study the animals and peoples in Paraguay to pass the time. During his two decades in South America, Azara collected as many avian specimens as he could find in an effort to collect a complete set of local bird species. Lacking university training in the discipline of natural history, Azara adopted scientific methods to suit his purposes from global sources. He used hybrid Spanish-Guaraní names for his "little birds," combining indigenous knowledge with his European education. In his multi-volume tomes on the flora, fauna, and ecology of the region, Azara lambasted armchair scientists who made discoveries not in the field but using stuffed skins and bones in the museum. Only later European naturalists, such as Alexander von Humboldt and Charles Darwin, began to appreciate Azara's work for its emphasis on observation of animals in their natural habitat. Azara's

embodiment of dual roles—Spaniard and American, civilian and army captain, amateur and professional—afforded him the flexibility to endure and survive in many different contexts, contemporary, historical or otherwise. This paper will examine Azara's many identities in relation to the natural and national South American landscape which he sought to observe, understand, and decode.

Between Tongues: Magic and Medicine in G.E. Rumphius' Het Amboinsch Kruydboek and Malay Kitab Tibb/Kitab Obat-Obatan *Genie Yoo, Princeton University*

Among descriptions of stems and petals, leaflets and pods, one will also find, in G.E. Rumphius' Het Amboinsch Kruydboek ("The Ambonese Herbal"), a strange account of a plant that gave the young a more "subtle tongue." Schoolmasters recommended it and students eagerly took it. Whether medically or magically induced, the dexterity of the tongue was believed to be a gift--in this case, a holy gift that helped Malay-speaking children pronounce Arabic correctly. Rumphius named the plant ABC daria and mentioned that plants like it were called oebat moerit, the "scholar's drug" in Malay, by "Moorish Papists" that populated the archipelago. The difficult link between magic, religion, and medicine in Rumphius' Kruydboek has yet to invite an analysis of how this European naturalist tried to negotiate cosmologies of knowledge in the Dutch East Indies with a writer's expectations of a European readership for his texts. Living on the island of Ambon from the age of 25 until his death, Georg Everhard Rumphius (1627-1702) explored, experimented, and wrote about the natural world of the Indies while working as an administrator for the United Dutch East Indies Company (VOC, Vereenigde Oostindische Companie). Through his engagement with local Muslim practitioners of medicine, not only was he able to procure recipes of healing and perform local experiments to test the efficacy of natural material, but he was also able to document practices he described as magical and superstitious. While this invites easy critique, I suggest that by reading Malay textual sources, variously titled Kitab Tibb/Kitab Obat-Obatan (Book of Medicine), alongside Rumphius' Kruydboek, one might get a better sense of how scales of difference and similitude--for example, between magic and medicine, the superstitious and the supernatural--came to be manifested through the process of documentation.

Scientific Women and Scientific Exploration: Gender and Erasure in Colonial Science *Megan Baumhammer, Princeton University*

A pillar of early modern scientific exploration was discovery: of uncovering novelty or lands newly discovered. The thematic structure of this narrative is intrinsic to the heroic aspect of many scientific endeavours, with a scientist as a hero at the center, eclipsing their use and adaptation of local knowledge to the western colonial scientific enterprise. This comes in contrast to the trope of the "scientific woman" - a comic character fascinated with unfeminine endeavours. In the late eighteenth century Joseph Banks' scientific expeditions were famously integral to the colonial exploration of the south Pacific. Maria Sibylla Merian's journey across the Atlantic in 1698 was as much part of a colonial scientific enterprise as Banks', but her gender precluded her access to official support. The reception of

her work after her death was overshadowed by her gender, therefore her scientific work and the authority she placed in indigenous sources were erased by the audience who might have perpetuated it. In this paper I compare the presentation of scientific knowledge in Merian's Metamorphosis Insectorum Surinamensium to her reception by Joseph Banks's colleagues and contemporaries. I argue that the priorities of epistemology were driven by narratives of exploration, and that those narratives were gendered to exclude Merian's contributions to botany and entomology. I show how the tropes of heroic exploits and masculine achievement were instrumental in the formation of science in colonial societies. The translation of knowledge from the colonial space to the reserves of science also involved a scientific gender.

Session Organizer:
 Megan Baumhammer, Princeton University
Chair:
 Hans Pols, University of Sydney

111. Doing STS in the Post-Soviet World: The Regression of Progress
Papers for Open Panels/Doing STS in post-Soviet world: The regression of the progress
Open Panel
9:00 to 10:30 am
ICC: E3.9

Due to the lack of funding in hard sciences and industry in the 1990s, post-Soviet countries suggest us a brilliant case to study the process of disassembling techno-scientific networks. They have suffered the collapse and overcome the breakdown of Soviet science and industry; it is time now to make use of former disasters and to explore the results of this unique social experiment. The experience and empirical data of post-Soviet countries are unique in terms of regression and breakdowns of many black boxes originated in Western culture, - vital infrastructures, R&D models, etc. Up to date, the analysis of regression in techno-scientific development was an unfeasible task for many STS scholars. That is why post-Soviet cases and application of STS models to analyze the S&T development in these countries can be fruitful theoretical and empirical space for STS scholars. This panel will explore national cases of S&T development in the post-Soviet world, focusing on the role of the state, cultural practices of R&D, shifting policy priorities between basic and applied research, and so on. This panel is looking for both theoretically and empirically grounded papers; papers that involve comparative focus between post-Soviet and "West" experience are especially welcome. The panel addresses various questions, including the theoretical charge to modify existent STS concepts for the specific context of the S&T development as well as the practical task to bring STS scholars interested in post-Soviet cases together.

Participants:
 Cultural Characteristics of Technological Entrepreneurship in Russia *Olga Bychkova, European University at St.Petersburg*

Whether Russian cultural practices promote or hinder the development of the high-tech industries in Russia? Can they be used to change the country into a highly developed economy? These were the questions explored by a group of researchers from the European University at Saint Petersburg. In my presentation, I'll talk about the results of this project and suggest explanations on the impact of cultural factors on the development of

technopreneurship in the country.

In Search for New Identity of Science Communicators in Russia: Between Science Propaganda and Popular Science Communication *Andrey Kozhanov, Higher School Of Economics, Moscow*

For a long period of Soviet history in Russia the official Science Propaganda was an official policy and only legitimation for Science-Society relations. Now we can see remarkable transformation of this model and specific practices in the field of Science Communication from mostly deficit model to more complicated hybrid models of communication between Science and Public. Increasing number of different forms and formats of Science Communication arises in Russian context, which is based both on reminiscence of Soviet model of Science Education and modern forms of gamification and Science Representation. Our empirical study of Russian Science Communicators as emerging social group with specific Identity, Beliefs and Self-Representations is based on the STS-questions and answers (Horst, Davis, Bucchi). Science Communicator in Russia – is it a person or a function? Is there a new institutional Identity for Science Communicator who is neither a Scientist or a Journalist in Russia? We argue that present movement for Public Engagement in Russia identify itself as nonreflexive scientific knowledge transfer more than promoting scientific pattern of rational and critical thinking as a set of specific social and cognitive norms. We are considering social, political, ethical, ideological and other issues as essential reasons and features of this new social group, explaining form STS point of view how the social recognition is archived and maintained.

Sociotechnical discrepancies in the Russian digital economy *Liliia Zemnukhova, European Univeristy at St. Petersburg*

Russia strives for the digital economy, which requires massive science and technology development reconsidering post-Soviet engineering heritage. But not only this. Material infrastructure, which is always highly heterogeneous and dependent on many physical and geographical factors, determines and anchors digitalization of Russian economy. Indeed, technological development caused expansion of the digital and gradually transformed communication, networking opportunities, and everyday life. Global netting gave rise to a natural need for ubiquitous digital technologies, though digitalization requires updated infrastructure and literacy. In this context, the professionals in IT sphere pioneered in skimming the cream off this digital revolution – they do not just use emerging possibilities, but rather create alternative spaces, other practices, and unanticipated discourses. The IT professionals represent a community, which incorporates advanced achievements in technoscience and implements its results for mass consumption. In the Russian context, they reinforce and legitimize technocratic perspective often ignoring the impending social transformations as technologies engage people, infrastructure, and skills, which in complex provide the human basis for the digital economy. The talk traces connections and discrepancies between official discourse on innovations and digital economy, practices, and views of professional IT community, and some case of user experience.

Session Organizer:
Olga Bychkova, European University at St.Petersburg

Chair:
Olga Bychkova, European University at St.Petersburg
Discussants:
Svetlana Moskaleva, European University at St.Petersburg
Liliia Zemnukhova, European Univeristy at St. Petersburg

112. How Do Governance Mechanisms for Science and Technology Travel Across Borders? 1
Papers for Open Panels/How do governance mechanisms for science and technology travel across borders?
Open Panel
9:00 to 10:30 am
ICC: E5.1

A major theme in transnational STS is technology transfer; highlighting that one cannot take a technology from one place to another and expect it to function in the same way. Technologies may fail, attain different functions, or be altered entirely. Not only do technologies travel, but so do the mechanisms for governing science and technology. Models of innovation, frameworks of risk assessment, blueprints for public participation, and metrics for technological performance all travel from country to country. In this panel, we explore what happens when governance mechanisms for science and technology travel across the globe. Literature from policy studies often departs from linear models of policy transfer and predominantly focuses on international organizations like the European Union and OECD. We aim to take a more symmetrical view, building upon recent literature on travelling imaginaries (Pfotenhauer and Jasanoff, 2017) and risk colonization (Beumer, 2017), to understand what exactly happens when governance mechanisms for science and technology travel from one place to another. We invite papers that help to feed critical discussions about the way science and technology governance travels, answering questions such as: how do actors draw upon practices from other places and adapt them to local conditions; what actor constellations are involved in making governance mechanism travel in different countries; what happens to governance mechanisms once they are appropriated in different contexts; how do travelling governance mechanisms abate or exacerbate inequality; and what kind of international governance mechanisms for science and technology are being developed?

Participants:

3D Printing Governance: transitions of local, global, physible and digital imaginaries *luke heemsbergen, Deakin University; Angela Daly, QUT; Thomas Birtchnell, University of Wollongong*

This paper considers transnational governance mechanisms of 3D printing across Eurasia. It draws insight from initial data collected from participants in China, India, Russia, and Singapore, where technical experts engaged with researchers in a multi-level perspective (MLP) backcasting methodology to imagine socio-technological regimes of 3D printing practice. We view 3D printing not just as a mechanical process specified through additive manufacture, but as a the communicative and social practices enabled by the network and enacted through and by digital-physical remediation. This allows a comparative analysis of histories and imagined futures across locales and in relation to global expectations of innovation, risk, and control. Our methodology focusses on six political dimensions involved in shaping imagined socio-technical regimes of 3D printing practice. Specifically, we present data on how dimensions of markets, culture, policy, law and technology are thought to influence each other and

enable shifts to socio-technical regimes. These dimensions produce complex patterns of both geo-local-specificity and convergence. Following Kostakis et al. (2016), we differentiate ideal types stretching from local knowledge structures to globally centralised ones and peer to profit based incentives of innovation. Our data present novel understandings of how socio-technical imaginaries transition from past to futures both within nations and across them. Our conclusions suggest complex patterns of how local socio-technological contexts transpire to specific constraints and generative practice. Kostakis, V., Roos, A., & Bauwens, M. (2016). Towards a political ecology of the digital economy: socio-environmental implications of two competing value models. Environmental Innovation and Societal Transitions, 18, 82-100.

Blinded by Technology? Genome Editing for Blindness and the Articulation of an Off-Target Problem *Seungho Yang, Seoul National University; GA EUN LEE, Seoul National University; Doogab Yi, Seoul National University*

CRISPR-Cas9 has emerged as one of the key genome engineering technologies. As excitement about its prospect for gene therapy and drug development increases, so do safety and regulatory concerns over genome editing experimentation and its commercial applications. This paper examines how a group of genome editing scientists in South Korea has sought to apply the CRISPR technology for gene therapy for ARB (Angiogenesis-Related Blindness) amid safety concerns and regulatory uncertainties. We in particular analyze how Dr. Kim Jeong Hun's team at Seoul National University has articulated an "off-target" problem as one of the most critical safety and regulatory issues over CRISPR. His improvement of the efficiency and specificity of the CRISPR technology in editing a gene related to ARB has been not just presented to a technology solution, but also promoted to a solution to key legal and ethical issues surrounding CRISPR-enabled gene therapy. We will highlight the process through which the scientists mobilize counter-arguments, developed across disciplines (biomedicine and GMOs), national boundaries, and the academia-industry divide, in order to address these key issues. By examining how his team has developed technical solutions, mobilized patient groups, and developed legal strategies, we will discuss how a certain set of the technocratic impulses in South Korea has crystallized around the CRIPSR technology.

Domestic chemical regulator behavior and international influences *Stefan Lodewyckx, Swinburne University of Technology; Erica Coslor, The University of Melbourne*

The process of regulating chemicals is an ongoing dialogue that has implications for relations between governments, rulemakers, industry, and the community. A chemical regulatory regime must balance the risks and hazards of chemical use with their economic benefits, ease of access, and efficient trade. While chemical regulators are responsible for their own jurisdictions, they must also be mindful of the actions of overseas regulators, foreign stakeholders, and the global scientific community. This is particularly important given the rise of global issue networks, novel regulatory challenges like nanoparticles and endocrine disrupters, and the push for regulatory upheaval led by the European Union's REACH regulations. We compiled the regulatory documents

originating from Australia and Canada relating to the re-evaluation of two pesticides: endosulfan and atrazine. Using content analysis, we compared the respective substances' trajectories in both countries and investigated the external vectors of influence the two regulators discussed when making key decisions and utilising various tools like the precautionary principle and hazard-based approaches. We investigated how these patterns could be impacted by levels of uncertainty, international developments, nature of evidence, and the state of domestic use patterns. Our results suggest that Australian and Canadian agricultural chemical regulators keep a constant eye on a range of external developments, however there is no uniform pattern as to whether these developments are regarded or, in many cases, regarded in the same way between regulators. This has implications for understanding the variations that can occur between communities of technical practitioners who share disciplinary backgrounds.

Friction in xenotransplantation: US and Australian regulatory responses to xenozoonosis *Rachel Carr*

Animal-to-human transplantation (xenotransplantation) opens up biological circulation across what is often understood as species barriers, mobilising non-human animal tissues and, potentially, microbes. From a regulatory point of view, the possibility that a new infectious disease of animal origin might spread into the human population poses significant problems. Scholars refer to this possibility as "xenozoonosis". In the 1990s, as xenotransplantation research intensified, experts from the US and the UK raised concerns about xenozoonosis within a broader contemporary understanding of emerging infectious disease, which emphasised the capacity for microbes to adapt quickly and stressed the increasing somatic interconnections across species and throughout the globe. Governments in many research-intensive countries, especially the US, responded to concerns about xenozoonosis by setting up frameworks for increased surveillance and preparedness as clinical trials of xenotransplantation proceeded. This preparedness approach in the US aligned with public health strategies in the paradigm of emerging infectious disease. However, the Australian regulatory body responded quite differently, placing a 5-year moratorium on xenotransplantation in 2004. In this paper, I draw on Foucault's taxonomy of governance mechanisms, particularly "security" and "sovereignty", to unpack the biopolitics of the US and Australian regulation. And, building on the concept of sociotechnical imaginaries, I discuss how the Australian regulatory response translated the discourse on xenozoonosis as a problem of bodily integrity and borders, in the context of historical public health practices and national imaginaries. The different regulatory responses to xenotransplantation exemplify what Anna Tsing calls "friction", the tendency for local and travelling discourses to reshape one another.

From emulation to adaptation: nanotechnology policies in Argentina, Brazil and Mexico *Noela Invernizzi, Universidade Federal do Parana; Guillermo Foladori, Universidad Autonoma de Zacatecas; Edgar Zayago Lau, Universidad Autonoma de Zacatecas; Tomás Carrozza, Universidad Nacional de Mar del Plata; Josemari Poerschke Quevedo, UFPR - Federal University of Paraná*

This study examines nanotechnology policy design,

implementation and outcomes in Argentina, Brazil and Mexico, from 2000 to 2016. The analysis is placed in the context of science, technology and innovation policy emulation and adaptation. The dimensions analyzed are partially based on the 2008 OECD Survey on Nanotechnology in order to facilitate broader international comparison. They include: policy design; instruments and funding; actors engaged in nanotechnology governance; ELS (Ethical, Legal and Social) and EHS (Environmental, Health and Safety) issues. Some indicators of scientific performance (publications; research personnel and university training) and business performance (patents, number of nanotechnology firms and density of the nanotechnology production chain) are used to assess nanotechnology policy outcomes. Main results show similar timing, goals and instruments of the policies in the three countries. The common goal of increasing competitiveness was reflected in actions oriented to the productive sector; however, they lacked coordination and sustainability. Governance was mostly limited to government, scientists and, to a less extent, business actors, with restricted spaces for civil society. ELS aspects remained largely unaddressed, while EHS issues emerged recently as increasingly important matters in Brazil and Mexico, in the context of the international regulatory discussion. Regarding policy outcomes, the three countries enhanced their human and material scientific capabilities. Companies in Brazil and Mexico were more dynamic in adopting nanotechnology; however the number of companies that perform R&D and more complex forms of innovation are scant. In all countries, most companies area situated in the intermediate and final bonds of the production chain.

Session Organizers:
Koen Beumer
Noela Invernizzi, Universidade Federal do Parana
Chair:
Koen Beumer

113. Trans/national Politics of Race, Racism, and Anti-Racism
Papers for Open Panels/Trans/national Politics of Race, Racism, and Anti-Racism
Open Panel
9:00 to 10:30 am
ICC: E5.10
Race and racism emerge in distinctive locally-specific ways in particular sites with particular histories, and diverse forms of antiracist knowledge-making projects and political movements are also highly local. At the same time, structures of inequality and their contestation are also intertwined with both global histories of colonization and with contemporary transnational liberation movements. What can scholars in science and technology studies contribute to understanding how ideas of race, racism, and antiracism travel within and between nations? This open panel welcomes a broad range of approaches to this question. Papers might explore how scientists and social justice advocates mobilize data about the impact of racism for trans/national antiracist projects; how scientists articulate their own experiences of racial inequality and their ideas about possibilities of change; how nationalizing and globalizing rhetorics of whiteness are used to justify oppression; the future of identity politics for health in shifting political landscapes in specific countries and transnationally; the roles of pharmaceuticals and other products of global capital in ameliorating/exacerbating inequality; the ways that pseudo/scientific racial narratives operate within and beyond

scientific spheres; and more. This open panel invites papers that make empirical and theoretical contributions to the intersectional, interdisciplinary viewpoints of how race, racism, and antiracism are at stake in politics within and across national scales. It seeks to generate new networks and conversations among STS scholars to interrogate these vital questions.
Participants:
Science After Apartheid: Trans/national Aspirations for Science for a Democratic South Africa *Anne Pollock, Georgia Tech*
This paper draws on a larger project about iThemba Pharmaceuticals, a small South African pharmaceutical company that was founded in 2009 with a mission of finding new drugs for TB, HIV, and malaria. Here, I will draw together two intertwined historical threads from the 1990s and early 2000s that form iThemba's pre-history: South African scientific exchange initiatives that aimed to foster a multi-racial scientific workforce for the new South Africa's R&D capacity; and efforts by scientists outside South Africa to bring the young democracy into the international community of drug discovery. These threads highlight interrelated sets of tensions: science in a democratic South Africa as dis/continuous with apartheid-era inequalities; South Africa as both developed/developing; and research and development capacity as simultaneously local/transnational. A broader tension that underlies these is South Africa as a nonracial/multiracial society, democratic and unequal, with the country's position in Africa and in the world at stake. iThemba manifested the challenge of working within these tensions, and can be read as an endeavor toward realizing Nelson Mandela's as yet not fully realized vision of science in the service of the people.
The 'Asian BMI' and Logics of Difference in Biomedicine *Mallory Fallin, Northwestern University*
In 2004, the World Health Organization (WHO) released a report that recommended lowering current body mass index (BMI) guidelines for Asian populations specifically, as previous research demonstrated that Asian populations had higher rates of cardiovascular disease and type 2 diabetes at a lower BMI than other populations (WHO 2004). Following this, in 2015, the American Diabetic Association (ADA) revised their type 2 diabetes screening guidelines for Asian Americans, lowering the screening threshold from a BMI of 25 to 23. However, translating the WHO's guidelines into clinical practice within the United States is a conceptually muddy process that requires making racial categories commensurate with biomedical categories. Drawing on interviews with doctor-researchers and textual analysis of research documents and policy reports, this paper investigates why biomedical researchers used both racial categories and BMI as the main tools with which to implement new public health policies, despite extant research that demonstrates the biomedical limits of both such measures. I argue that the invisibility of Asian health problems more broadly led to Asian American researchers strategically using the ADA in order to render visible Asian health, through the objective veneer of numerical measures. Although doctor-researchers recognized that the revised guidelines were not scientifically accurate per se, they saw it as a practical intervention that would simultaneously address a pressing health issue and highlight Asian health disparities. This paper further points to the ways in which scientific accuracy and

clinical practicality more generally are not always aligned, and the challenges of translating research into practice.

Race/ethnicity and genome-based drug toxicity studies *Shirley Sun, Nanyang Technological University*

In order to arrive at the goals of precision medicine, population-based genomic studies aim to identify potentially important single nucleotide polymorphisms (SNPs) with regard to drug response. A major concern in clinical practice is to mitigate the level of toxicity of drugs on patients. Even for drugs in primary care, concerns for adverse drug reactions remain substantial. In this presentation, I discuss the inevitable tensions surrounding the usage of genetic information in deciding appropriate drugs for the patients. I examine the issues and concerns that oncologists have for collecting and using germline genetic/genomic information in reducing adverse drug reactions. Drawing on clinical level interview data with oncologists and medical scientists in Singapore, California (USA), and Vancouver (Canada) who are tasked with delivering precision medicine on the front line, I discuss when and whether certain population categories (e.g. ethnicity, race) are being used in a manner that obscures or illuminates differences in adverse drug reaction. I argue that the issues are not only about the lack of funding, but also other more fundamental factors – including, but not limited to, the social construction of race/ethnicity and the fact that adverse drug reaction is a complex trait – that contribute to a considerable lack of clinical utility of such genomic studies of cancer drug toxicity effects.

Session Organizer:
Anne Pollock, Georgia Tech
Chair:
Melissa Creary, University of Michigan, School of Public Health

114. Something from Nothing: Exploring Non-discovery and Negative Claims
Papers for Open Panels/Something from nothing: exploring non-discovery and negative claims
Open Panel
9:00 to 10:30 am
ICC: E5.2
Participants:

Methods to Study Gaps: The Ethics of the Invisible *Marcus Foth, Queensland University of Technology; Ann Light, University of Sussex; Sara Heitlinger, Newcastle University; Aleesha Joy Rodriguez, Queensland University Of Technology*

Haraway (2015, p. 160) mourns "irreversible losses" in the Chthulucene – constituted in time and space. Over time, extinct species leave gaps in the ecological system of living beings that biological sciences are still trying to disentangle. Yet, the infinity of small and large scales may render this work forever incomplete. In the quest to decentre the human towards a post-anthropocentric worldview (Forlano, 2016, 2017; Light, Powell, & Shklovski, 2017), we critique some of the emerging repercussions. Legal personhood was bestowed on the Whanganui river in New Zealand, and the Ganga and Yamuna rivers in India. While introducing legal rights for nature is a welcome move, the very notion of personhood is problematic. Not only does it give a natural entity, a

"river," legal rights akin to a citizen or corporation to "enter and enforce contracts, and the ability to hold property" (O'Donnell & Talbot-Jones, 2017), the river's delineation as "person" risks overlooking the very entanglement of and with nature. We explore an alternative perspective: Other parts of academia have come to peace with the ontological impossibility of accounting for the complex fidelity of reality's entanglements. In historiography, losses and gaps are studied as a way to approximate a distributed (and contentious) world narrative over time (Hewitson, 2014). Learning from historiographic methods for studying historic gaps, we seek to approach an appreciation of how gaps and absence can draw attention to the fallacy of human exceptionalism. This pathway may offer new epistemological understandings that focus on the aesthetics and ethics of the invisible. References Forlano, L. (2016). Decentering the Human in the Design of Collaborative Cities. Design Issues, 32(3), 42–54. Forlano, L. (2017). Posthumanism and Design. She Ji: The Journal of Design, Economics, and Innovation, 3(1), 16–29. Haraway, D. (2015). Anthropocene, capitalocene, plantationocene, chthulucene: Making kin. Environmental Humanities, 6(1), 159–165. Hewitson, M. (2014). History and Causality. Springer. Light, A., Powell, A., & Shklovski, I. (2017). Design for Existential Crisis in the Anthropocene Age. In Proceedings of the 8th International Conference on Communities and Technologies (pp. 270–279). ACM. O'Donnell, E., & Talbot-Jones, J. (2017, March 24). Three rivers are now legally people--but that's just the start of looking after them. The Conversation.

The Case of the '750 GeV': Exploring 'non-discovery' and Transformations in High Energy Experimental Physics at the Large Hadron Collider *Sophie Ritson, Alpen-Adria Universität Klagenfurt / Wien / Graz*

The 750 GeV had a short life span: from a potential revolutionary new particle in 2015, to nothing but a statistical fluke in 2016. Two experiments at the Large Hadron Collider (LHC) in Geneva, the 3000 member ATLAS and CMS collaborations, each reported seeing a bump in the data of low statistical significance, indicating hints of revolutionary new physics in December 2015. This triggered the writing of hundreds of theoretical physics papers before the collaborations announced in October 2016 that the potential revolution was over. By that time, the 750 GeV had a Wikipedia page and over 500 theory papers dedicated to its explanation. Importantly, the non-discovery violated a decade of high expectations that some new physics would be found at the LHC in their 2015-2016 data. This paper asks what may be considered to have changed when a potential revolution ends. After a discovery claim is established, the world is reported to be different; by contrast, when something is lost which was never had, seemingly nothing has changed. Drawing on interviews with some of the key experimental physicists involved in the search for, analysis of, and ultimate non-discovery of the 750 GeV, this paper explores the shift in research strategies and their reflections after the episode. In particular, the paper explores how the absence of direction in research strategies, which the 750 GeV could have provided, was and is being accommodated, both experimentally and theoretically.

"There is no such thing as depression": How Claims of Non-existence Transform the Epistemic Infrastructure of Psychiatric Knowledge Production *Thomas Lemke; Jonas Rueppel, University of Frankfurt*

Major depressive disorder (MDD) is frequently considered the leading cause of disability worldwide. It was 'invented' as a standardized mental disorder in 1980, as part of the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM). DSM-III and its subsequent editions met the interests of psychiatric researchers and pharmaceutical companies by establishing symptom-based definitions of psychiatric diseases. This process of standardization promised to advance bio-psychiatric research and to foster drug development. However, the high expectations remained unfulfilled. Today, there is still no valid biomarker for any of the main psychiatric disorders. An increasing number of relevant actors (e.g. the US National Institute of Mental Health) link this scientific and medical failure to the design of the DSM, which currently serves as the 'gold standard' in mental health research. According to this claim, biomarker studies in major depressive disorder were doomed to fail, because MDD does not exist as a homogeneous entity. Based on interviews with experts in depression research and document analysis, we will map this controversy. Our paper shows how the assertion of non-existence is mobilized to transform the epistemic infrastructure of mental health research. These critiques lead to an integrative analysis of various forms of biological and psychological information, which is designed to enable the "bottom-up" identification of "data-driven biotypes", instead of using the DSM classification as the starting point. As we will show, this strategy of 'nosological abstinence' establishes the brain as an obligatory passage point of psychiatric knowledge production.

Tidy Thoughts On Creativity *Peter Müller, Technical University Munich*

Neuroscientific research on creative cognition entail the very problem of scientific, quantitative measurement methods and suitable conceptualizations. Creative cognition in terms of solving (inherently) difficult problems deals, by design, with prospective openness; however, those issues are not only objective but intrinsic for creativity research itself. Hence, such research features great contrasts for studying practices of (Latourian) "modern tidiness" within (neuro)science: separating crossings of creativity and rationality, of creative not-yet-rationalities beyond and scientific rationalities within given heuristic boundaries. Thus, creativity research is 'tidying' its own creative efforts corresponding to scientific dispassion and technicity ideals; on the inside, the tentative breaching of creative thought is, at the same time, highlighted and yet reconstructed as plain, cognitive mechanisms, merely grounded within the individual. Due to this "tidying work" the dynamics and constitutive role of problem-solution-relations for heuristic setups are barely visible, leaving Wittgensteinian language issues. An STS inspired discourse analysis was applied: studying neuroscientific publications concerning explanations or measurements of creativity and comparing them with papers from other disciplines, e.g. ergonomics. To broaden the empirical contrast, ethnographic observations of practices that, vice versa, emphasize their creativity over rational orderliness are also taken into account. This research contributes descriptions of the modern, scientific performances of rationality and struggles at its boundaries of formalization, trivialization and rationalization. Furthermore, this "tidying" of human cognition takes place within the ongoing conceptualization of human mind, which reaches out to other areas that try to imitate human cognition, e.g. AI.

The Strength of Being Inconclusive: Weakness of Evidence and Environmental Shift of Genetics of Sexual Orientation *Michel Dubois, Epidapo - CNRS - GW*

This talk is part of an ongoing sociological investigation on the biology of sexual orientation. Although the search for the genetic basis of sexual orientation is a long term scientific enterprise, most of the scientists involved describe their field as "promising" but still predominantly "inconclusive". Though in the 1990s a few linkage studies pointed a possible role for certain genes on the X chromosome (Hamer et al., 1993), it became rapidly clear that these findings couldn't be easily replicated. In the 2000s, the main outcome of one of the very few available genome-wide association study (using 23andMe database of over 180,000 individuals) was unambiguous: "We did not find evidence of SNPs associated with sexual identity (…) nor did we replicate previous findings (…)" (Drabant et al., 2012). And even more recently, reviewing the literature on sexual orientation, a group of prominent scholars considered that they could reasonably provide a qualified answer to the question "Is sexual orientation genetic?" That answer is: "Probably somewhat genetic, but not mostly so" (Bailey et al., 2016). In this talk we will adopt a sociohistorical perspective on the construction of the "limits" of genetic knowledge of sexual orientation. What are its core negative claims, but more importantly how do geneticists accommodate these claims practically and conceptually? We will show how the recent environmental turn of the genetics of sexual orientation might be understood as a consequence of this accommodation process.

Session Organizer:

Sophie Ritson, Alpen-Adria Universität Klagenfurt / Wien / Graz

Chair:

Helene Sorgner, Alpen-Adria-Universität Klagenfurt | Wien | Graz

115. Climate, Science and Empire: Bridging Historical and Current Developments

Papers for Open Panels/Climate, science, and empire: Bridging historical and current developments
Open Panel
9:00 to 10:30 am
ICC: E5.3

Participants:

'Climate Does Not Change': Agricultural Capitalism, Climatology, and the Stabilization of Climate, 1850s-1900 *Zeke Baker, University of California, Davis*

The present paper provides an account of trajectories in climatology, roughly from the 1850s to 1900, the period during which climatology emerged as an organized branch of meteorology and related sciences. The historical narrative traces the development of climatology both as a professional/institutional project and as components of a

larger governmental logic. In particular, through textual analysis of climatologists' reports, books, maps, and professional organization, the paper provides a sociological explanation for the emergent 'stabilization' of climate as a geographic-statistical category. The central argument is that climatic stability, or the view that climate was unchanging and legible upon clearly demarcated spatial units, was advanced in a way that linked the interests and material practices of climatologists with the broader administration of commercial agriculture, trade and finance. I situate the significance of developments in climate 'stabilization' over the 1850-1900 period with reference to prior efforts to govern climate through its changes. The chapter concludes by placing climatology and industrial governmentality within a broader genealogy of 'climate stabilization', one which continues to develop today through dominant approaches to climate policy and within geoengineering research.

Farming Outside the Lines: Rain Follows the Plow in 21st Century Art and Popular Culture *Susan Elizabeth Swanberg, University of Arizona*

Climate change misinformation and disinformation have influenced policy decisions at important moments in history, including the recent U.S. retreat from the Paris Climate Accords. It's imperative, therefore, that we reexamine and learn from historical episodes where faulty environmental information was disseminated and relied upon. One such example involved a pseudoscientific 19th century notion encapsulated by the phrase "rain follows the plow." This belief maintained that cultivation of arid lands west of the 100th Meridian in the United States would increase the evaporation of moisture, boost precipitation and effect a permanent change in the climate. Based upon this 'theory,' settlement and intensive farming of arid lands beyond the 100th Meridian was encouraged, leading to the Dust Bowl's human and environmental catastrophes. "Rain follows the plow" was also invoked in South Australia to justify settlement of lands beyond Goyder's Line, which delineated the limits of reliable rainfall. In the U.S. and Australia, the notion that cultivating arid lands increased rainfall played out in the press, in scientific circles, in government and in the lives of those convinced the maxim was true. In the last decade, "rain follows the plow" has emerged as an ironic trope or cautionary tale in print journalism, the visual arts, music and song. This paper revisits the origins of the phrase and examines the significance of its resurgence in journalism, the arts, music and popular culture narratives.

Indigenous knowledges and adaptation to a changing climate *Sophie Adams, UNSW*

Climate change response is the latest site of a highly charged discursive negotiation of the role and authority of Australian Indigenous peoples in the continent's natural landscapes. For most of Australia's post-settlement history, views of Aboriginal and Torres Strait Islander peoples either as an element of the fauna or as a threat to the 'wilderness' have been put in the service of various forms of colonial dispossession. Only relatively recently have these views given way to a perception of Indigenous peoples as holding a uniquely sustainable and sophisticated relationship with the natural environment. In the context of climate change, Indigenous perspectives are increasingly valued for their insight into historical environmental changes and observation of contemporary climatic changes – as well as, more broadly, the perceived potential of the revitalisation of traditional ecological knowledges and practices of 'caring for country' to build the adaptive capacity of indigenous peoples in the face of climate change impacts. At the same time, however, the unprecedented rate and scale of anthropogenic climate change is seen to call into question the contemporary relevance of traditional Indigenous knowledges. This paper outlines how these discourses have come to be possible and, focusing on how the emerging tension between them is negotiated in adaptation policy and research, discusses the possibilities and constraints that they entail for the Indigenous subject of adaptation.

Sustainable accounting mechanism: an approach for bridging historical and current developments in the globalized era *Md. Hafiz Iqbal, Government Edward College, Pabna-6600, Bangladesh*

Globalization is a natural outcome of the sustained technology and economic growth, which originated with the Industrial Revolution in Britain during the 18th century. Capitalization is guided by the globalization. Under this circumstance, natural resources depleting economic activities increased day by day. Developed countries emit more GHGs and polluted our environment that are threatened for our future generation or grandsons. In addition, peoples' ignorance of the non-disconnectable relationship between humans and nature is another cause behind the depletion of nature. Thus, it is the time to rethink about the existing development approaches and examine the effectiveness of alternative approaches related to all sorts of development and human well-being. Under this circumstance, sustainable accounting principle plays an important role. The sustainable accounting approach shows the ways forward in resilient, nature and ecology centric development. It is guided the spiritual thinking and simple living. Simple living and realistic thinking teach humankind that everything on earth, including the finite and diminishing natural resources. This means that over exploitation, misuse and abuse of precious natural resources like forest, ocean, air, hydrology or land may have a devastating impacts on earth resulting in such consequences as climate change, social unrest, insecurity and poverty. Modesty, kindness, togetherness, simple and natural lifestyle, eco-cultural diversity and 3R (reduce, reuse and recycle) approach are the main building blocks of the sustainable accounting. The central research question of this study is: what are the main themes and massage of different religions and traditional Baul songs and how do they relate to sustainable accounting. To answer this unexplored research question, this study depends upon In-depth Interview of religious leader, focused group discussion (FGD), key informant interview, religious books, other relevant documents and observations. Provision of wise use of resources, co-existence of flora and fauna with harmonious relationship and optimum exploitation, extraction and consumption of finite natural resources can uplift the environmental condition and hence to develop the living conditions for all and human well-being. This study argues that sustainability as a dynamic entity generated by the synergies between stewardship attitude to social growth and managing ecological footprint. The finding of the study ensures the sustainable development and provide a robust basis for planners, policy makers,

researchers, government and development partners for development of specific policies, further research and project to lessen the vulnerability to climate change and promote sustainable planet for our future generation. Keywords:Sustainable accounting, Ecological sustainability, green growth, resilient society, Bangladesh

The Mekong Delta Plan and the transnational governance of climate change adaptation in Vietnam *Jacob Weger, University of Georgia*

With an emerging scientific consensus identifying river deltas as especially vulnerable to the effects of climate change, efforts have been underway to mainstream climate change adaptation into development initiatives in many delta countries. Yet understanding how this process unfolds demands attention to how knowledge is translated from one context to another and across levels of governance to influence climate change adaptation locally. In this effort, the Dutch government and water sector have figured prominently, through the export of Dutch "delta management" expertise to countries including Vietnam, Bangladesh, Myanmar, and others. This paper examines the "Mekong Delta Plan" (MDP), produced through a strategic partnership between the Vietnamese and Dutch governments in 2013, as a vehicle for the translation of knowledge to shape climate change adaptation in the Mekong Delta of Vietnam. Drawing on ethnographic research at sites in Vietnam and the Netherlands, the findings illustrate how the MDP has come to play a key role in the governance of climate change adaptation in the delta, and what this means for the delta's long-term development. The study contributes to understanding the politics of knowledge and translation at work in environmental governance, as well as the relationship between scientific expertise, development politics, and the socio-material evolution of landscapes in the context of climate change.

Session Organizer:

Zeke Baker, University of California, Davis

116. 'Evidence-making Intervention': Transforming Implementation Science 1

Papers for Open Panels/'Evidence-making intervention': transforming implementation science
Open Panel
9:00 to 10:30 am
ICC: E5.4

'Evidence-based' policy and practice has become the dominant organising paradigm for health care and medicine in the western world. Within this, implementation science has emerged as a sub-discipline with a focus on developing methods which promote the integration of 'evidence' into healthcare policy and practice. Implementation science aims to understand how social contexts shape the delivery of 'evidence-based' health interventions, however such aims rely on range of ontological assumptions about the stability of 'evidence' and 'interventions' as it investigates the 'transferability' or 'translation' of these presumed-to-be fixed objects into new sites. This Open Panel invites papers which seek to return questions of ontology to the field of implementation science, grapple with 'evidence' and 'interventions' as objects in-the-making, and reflect critically on practices of evidence-making. We propose engagement with an 'evidence-making intervention' approach which assumes there to be no clean distinction between knowledge and practice, or context and content, and takes both 'evidence' and 'interventions' as objects produced and remade locally through implementation practices. Here, 'evidence' can be

said to emerge immanently, a transient effect of its connections and disconnections with multiple other bodies of knowledge and a range of material-discursive practices, including those associated with science and policy. In keeping with the conference theme, this panel aims to bring together a transnational network of scholars with interests in the development, trial, transfer and promise of new health technologies, with the goal of transforming one of the dominant health policy and practice paradigms of our times.

Participants:

Performing 'Evidence' at Scientific Conferences: the Making of Treatment Promise in the Hepatitis C Elimination Era *Kari Lancaster, UNSW Australia*

The notion of 'evidence-based' policy and practice has been enthusiastically embraced across health and social policy. However, such pursuits are underpinned by range of problematic ontological assumptions about the anterior, singular and stable character of the thing we call 'evidence'. Drawing on scholarly work on the performativity of scientific knowledge and practices, this paper will reflect critically on practices of evidence-making, taking the dynamic new era of hepatitis C treatment advancements as a case study. In particular, this paper will analyse the scientific conference as a key evidence-making event. To do so, I will draw on ethnographic data generated through observations of key national and international scientific conferences, where the 'hepatitis C elimination agenda' has been subject to claim and counter-claim, illuminating the making of 'evidence-based' promise in these settings. This paper will focus on the coming together of the social and the material, human and non-human, in these conference sites, to investigate the emergence of 'evidence' as a thing-in-the-making.

Data as Practice: Measuring Outcomes in Australian Poverty Interventions *kylie valentine, UNSW*

Poor people in rich countries are typically in contact with multiple systems of health and social care. The design and implementation of 'evidence-based' interventions for people with multiple needs is a long-standing policy concern that in recent years has been animated by two new fields. On the one hand, the adoption of implementation science in the human services is intended to ensure standardised and measurable practice, and avoid the messiness of local decisions and judgements that are thought to dilute the efficacy of evidence-based interventions. On the other hand, big data and data linkage are described as having the potential to reduce the costs and imperfections associated with evaluation and monitoring data, and provide a comprehensive, even predictive, view of both populations and interventions. Although distinct fields, both implementation science and data linking have been hailed as evidence-led strategies which can improve interventions. Yet research on the delivery of health and human services shows that assumptions around the status of data and evidence are troubled in practice. Local contexts of implementation are more meaningful than simply risks to implementation fidelity. Data is contested, dynamic, and both evidence and intervention. It is also multiple: the data produced by practitioners for case files of vulnerable families is distinct from that used to report on government expenditure and population outcomes. This paper, which draws on several research projects, adds to the scholarship on stabilised networks and data in practice, and provides

new insights on the implementation of health and human services interventions.

Evidence-Making in Expert Accounts of Cancer Screening: Views of Australian Health Professionals *Kiran Pienaar, Monash University; Alan Petersen; Diana M Bowman, Arizona State University; Stephen Derrick*

Australians have high expectations of national cancer screening programs as effective tools for early disease detection. But are these expectations higher than warranted? While many people benefit from early diagnosis through screening, research shows that some screening tests may lead to a cascade of further tests and unnecessary, sometimes harmful, treatment. In this paper, we draw on qualitative interview data with Australian health professionals to explore their views on screening. Applying concepts from science and technology studies, we focus on the evidence-making processes through which screening is enacted as a beneficial population health strategy, asking how health professionals justify screening when the evidence is contested. While some of our participants emphasised the protective value of screening, others expressed mixed views about its benefits and risks, and we suggest this is linked to the evidentiary uncertainty surrounding screening. In conducting this analysis, the paper applies an 'evidence-making intervention' approach, which conceives evidence as produced through, and contingent on, the practices of science, policy and medicine. Challenging the dominant view that evidence comprises a stable body of knowledge which can be integrated into policy, our paper argues for closer scrutiny of how evidence is assembled to justify particular interventions and to manage uncertainty. While we explore these issues in the context of population-based screening, we also address their broader implications for the evidence-based policy endeavour as the dominant paradigm in Western healthcare settings.

Qualifying Leaky Vaccines: The Case of a Malaria Vaccine *Janice Graham, Dalhousie University; Koen Peeters Grietens, Antwerp Institute of Tropical Medicine*

While no vaccine provides 100% immunity, a growing trend towards licensing 'leaky vaccines' known to have suboptimal efficacy opens a crack into previously accepted regulatory principles of optimal level of protection for populations. The acellular pertussis vaccine, for example, is less immunogenic than the whole-cell type, yet commands the market in high income countries. Public health programs promote flu vaccination even when the seasonal vaccine is suboptimal. A global trend to progressive licensing has, we suggest, served to provide opportunities to market leaky vaccines while general health system improvements remain neglected. The high bar set by the high efficacy of routine vaccines for measles, mumps, rubella, tetanus and diphtheria has been dropping. Lower standards for efficacy open inquiry into what is an acceptable level of infectious disease in populations, and where, when and at what level of efficacy should a vaccine be implemented. The success of the smallpox eradication program has failed to be repeated for polio, yaws, dracunculiasis, hookwork and yellow fever and malaria. Through ethnographic insights from the field of vaccine development, we engage with the question of why leaky vaccines are increasingly acceptable and qualified as efficacious health interventions. We consider the ontological,

epistemological and public health assumptions that are shaping the evidence for a candidate malaria vaccine with less than 40% efficacy that constitutes the latest product being readied for implementation in the global vaccine marketplace.

Generating "evidence-based guidelines" in integrated care programs: translations and requalifications *Nathan Charlier, University of Liege*

The Belgian government program "Integreo" is a large policy plan that aims at implementing integrated care for patients with multiple chronic conditions. Integrated health services are defined by WHO as: "the management and delivery of health services so that people receive a continuum of preventive and curative services according to their needs over time and across different levels of the health system". In practice,14 pilot projects will implement integrated care programs in local settings, involving various healthcare professionals to change the organization of care provision in specific networks. "Evidence-based guidelines" in care provision is presented as a key component of the policy plan. Yet it remains somewhat under-defined and problematic. Integrated care calls for patient-centered multidisciplinary coordination, while many "evidences" emanate from monodisciplinary settings, focusing on one pathology. According to policy documents, evidence-based guidelines should be assessable by standardized indicators, but they should also be adapted to the context in order to be operational and clear. Thus, to generate guidelines and change practices, evidences have to go through multiple translations among different groups of stakeholders: scientists, government authorities, healthcare practitioners. Furthermore, once established, evidence-based guidelines might clash with other key components of integrated care such as patient involvement. As part of the scientific team evaluating the pilot projects, I will observe the implementation of the policy plan and the interactions between its stakeholders. I will investigate how "evidence-based guidelines" unfold in the policy plan, in different settings and groups, allowing me to draw insightful conclusions about the requalification of knoweldgeS.

Session Organizer:
Kari Lancaster, UNSW Australia
Chair:
Kari Lancaster, UNSW Australia

117. Digital Imperialism: Colonizing Everyday Lives in the Global South I: Infrastructures of Power
Papers for Open Panels/Digital imperialism: colonizing everyday lives in the Global South
Open Panel
9:00 to 10:30 am
ICC: E5.5
Participants:

Data Centers as Infrastructures of Empire *Brett Neilson, Western Sydney University*

Otherwise known as server farms, data centers are infrastructural facilities that accommodate computer and network systems that store, process and transfer digital information in high volume at fast speeds. These installations support modes of governance and expressions of power that extend across vast geographical expanses. However, data centers tend to cluster in

particular territorial environments, often based on the presence of infrastructural conduits that date back to previous episodes of imperial expansion. For instance, Singapore hosts over fifty percent of the servers in South East Asia, partly due to the presence of cable connections that were established by the British in the late nineteenth century. Stemming from research conducted between Institute for Culture and Society at Western Sydney University and Calcutta Research Group, this paper explores the resonances between these previous expressions of imperial power and the present day dynamics and churn of the data center industry. Specifically, I study the withdrawal of Tata Communications from the Singapore data center market, the building of the company's assets on the subcontinent, and their expansion into data center markets in East Asia and the North Atlantic. The paper works against the tendency to explain contemporary imperialism as the imposition of technologies and techniques centered in the global North on populations in the South. Rather, I seek to complicate the North/South binary by emphasizing capital's role as a political actor and studying historical continuities that become evident only when empire rather than state is taken as a basic unit of analysis.

Data, infrastructure, citizenship: of illegal immigration and a citizen identification project *Khetrimayum Monish Singh, The Centre for Internet and Society*

In India, databases such as the UID/ Aadhaar represent new 'sociotechnical imaginaries' (Jasanoff and Kim, 2015) of data infrastructures that mediate state-citizen relationships in a political regime of public-private partnerships. Database politics, around such data infrastructures, therefore represent new forms of categorizations – who is a citizen, who is a resident and who is a welfare beneficiary. In this paper, I investigate the update of the National Register of Citizens (NRC) database in Assam (India) as a case study to map the emergent changes in one of the core modalities of Indian governance: the unique identification of citizens. The NRC, as a part of the National Population Register (NPR), is a list of only Indian citizens, and is currently in the process of being updated only in Assam. This update is driven by concerns around illegal immigration from neighbouring Bangladesh, the history of identity politics in Assam, and constitutional and legislative rules and provisions which define the nature of citizenship in India. While promising formal integration into the legal system of rights, the NRC database also inevitably reflects a controversial exercise evident through the inclusion/ exclusion of individuals. Situated at the intersection of Science and Technology Studies and Infrastructure Studies, this paper seeks to problematize this particular infrastructure, and the challenges and concerns following legal, bureaucratic and technical processes of categorization, identification, data collection and data verification of a diverse demography.

Dealing with Shortage, Overflow and Containment of 'Information' when Disaster strikes: Case of Nepal's 2015 Earthquake and its Responses *Sohan Prasad Sha, Martin Chautari, Kathmandu, Nepal*

When Disaster strikes it's not only breakdowns the socio-technical order but also disturbs the collective responses that challenge the managerial vision of 'orderly system' (pre to post). The paper undertakes the case of Nepal's 2015 earthquake that took lives of nearly 9000 people and many more injured and millions homeless. In particular, the paper explores the three months of immediate institutional and collectives' responses in midst of a knowledge gap of crucial information required for 'rescue and relief' operations to deal with disaster. The papers examine how the shortages of data portray at the time of crisis and how the overflow of information coming in through social media, crowdsourcing through open source and open data platforms and various other avenues while the failure of the state to recollect the institutional memory with the repository of information at the disposal to make use of it in the disaster. The paper undertakes three actors and their standpoints at the time of crisis: the state, the non-governmental agencies (like Kathmandu Living Labs) and the people's collective responses. The theoretical underpinning will be based on interdisciplinary approaches like Science and Technology Studies and, in particular, 'infrastructural inversion' (Bowker & Star, 1999). The paper critically argues that the Nepalese case of disaster unravels the erection of new informational databases not only at the cost of making 'the past as indeterminate' but also the practical politics of classifying and standardizing the databases constantly were the process of 'remembering to forget'(Raj, 2015) the earthquake victims.

Locating Infrastructures: The Aesthetics of Mobile Coverage in Fiji *Heather Horst, University of Sydney*

Telecommunications policies, companies and infrastructures have significantly transformed the experience of connectivity, channels of communication, information and exchange over the past two decades. Such changes reflect a series of material, financial, technical, political and social relationships that are bundled together through a range of infrastructural spaces and networks (Star 1999, Star and Lapland 2009, Dourish and Bell 2012). While academic attention to infrastructures has explored processes such as breakdown and boundary work, recent work in the global south challenges the inherent invisibility of infrastructures and, in turn, call for an examination of when, why and how particular infrastructures are made visible (e.g. Starosielski 2015, Foster and Horst 2018). This chapter draws upon three years of ethnographic research on the moral and cultural economy of mobile phones in Fiji to explore how mobile infrastructures are made visible. Through analysis of coverage maps, interviews with telecommunications providers and users, I explore Larkin's (2012) suggestion that the aesthetics of infrastructures are "governed by the ways infrastructures produce the ambient conditions of everyday life: our sense of temperature, speed, florescence, and the ideas we have associated with these conditions" (336-37). I conclude by reflecting upon the ways in which coverage maps do (and do not) aesthetically naturalise the infrastructures of mobile phone speed, geographical coverage and the presence of mobile phone companies, and the work this does for a range of national and international stakeholders in the mobile network.

Session Organizer:
Marine Al Dahdah, Cermes3

118. Lost in Translation: (The Politics of) Expertise in Legal and Regulatory Translation Spaces Session 1
Closed Panels

Traditional (Closed) Panel
9:00 to 10:30 am
ICC: E5.6
While translation of scientific expertise for and by non-scientists is inevitable in the courtroom and in regulatory contexts, a challenge remains to better understand the "spaces" in which this translation work is being done, as well as the ways in which the mediation, reconstruction, or shaping of scientific knowledge potentially encourages questionable or confusing outcomes. The papers in this panel offer examples (from various law or policy contexts) of missteps and challenges in translating scientific expertise, including (i) the manipulation of testifying experts by the non-scientist lawyers who hire them, (ii) the idealization of non-scientist juries as having a clear understanding of scientific testimony, (iii) the pressure on non-scientist arson investigators to be "scientific," (iv) the legal and technological narratives in wrongful conviction scholarship, and (v) the ways in which legal and regulatory pressures to provide public information about health risks may undermine mainstream scientific perspectives. And while problems of the epistemic status of scientific knowledge in legal/regulatory contexts is not a new theme in STS, there are new anxieties stimulated by 'post-truth' pre-occupations of many citizens—overt political pressures seem to be increasingly applied to regulatory institutions. The solution is not to avoid translation, but more transparency and accountability. By including Australian and U.S. scholars on the panel, we will take a comparative/transnational approach, giving examples of existing problems and currently proposed solutions in two different national contexts.

Participants:

"Dirty" Experts in US and Australian Law: A Comparative Perspective on the Use of Consulting Experts to Manipulate Testifying Scientific Experts *David Caudill, Villanova University*

U.S. and Australian attorneys often hire consulting scientists who are not used as testifying experts. The colloquial distinction is between a "dirty" and a "clean" expert, the former being in the role of a consulting member of the client's "legal team." A "clean" expert hired to testify is then called "independent,' signaling that he or she is not an advocate. In contrast to the U.S. discourse on expertise, the conversation in Australia reflects ethical concerns that both (i) explain why the term "dirty" is used to describe an advocacy-oriented expert, and (ii) likely arise from the fact that in some Australian states, a testifying expert is bound by a code of conduct providing that his or her primary duty is to the court. In the U.S. context, there is seemingly nothing troubling about a consulting expert later becoming a testifying expert; in Australia, that situation raises red flags, because an expert during settlement negotiations would then be required to be independent at trial—a potentially difficult transition. The purpose of this paper is to explore ethical issues raised by the use of consulting experts—for example, are the risks of an attorney influencing a testifying expert's scientific opinion increased by the use of consulting experts who are not disclosed or cross-examined? And are we worried that, after working with a dirty expert to identify the weaknesses of a case, a clean expert may be manipulated by limiting the information (known to the attorney) given to that expert who will testify?

Science Anti-Science and the 'Right to Know' *David Mercer, University of Wollongong*

In October 2017 the United States Court Appeals for the Ninth Circuit rejected an appeal by the CTIA Wireless Association (US trade Organisation representing the Cell Phone Industry) to block a mandate proposed by Berkeley City Council requiring cell phone retailers to provide information to consumers at the point of sale informing them that if a phone is carried in a pocket or a bra, that it is possible that Federal radiofrequency exposure guidelines will be exceeded. The implications of this decision are being closely monitored by industry, regulators and activists. The CTIA have suggested that the mandate represents 'a war against science' and that its members are being conscripted to "utter anti-science views". For Berkeley, assisted by eminent lawyer Lawrence Lessig, the case was about the public having a 'right to know' about what they were purchasing, not the Rf scientific controversy, and that the mandate merely reiterated information consistent with the CTIA's 'own science based standards'. The case, will be used as platform to consider the tensions that emerge where legal principles, regulation and science intersect and require translation. Does the mandate leave the public better scientifically informed, or prone to unreasonably amplifying scientific uncertainties? Is the mandate pro or anti- science? It will be suggested, drawing on concepts of legal- deconstruction, civic epistemology and boundary work, that the fit between notions of science, truth, transparency and legal rights, requires an analysis that is sensitive to the social and political context in which these notions are brought together.

Translating forensic science for judges and jurors: Re-assessing trial safeguards and legal deconstruction *Gary Edmond, UNSW Australia*

Historically apex courts, lawyers and STS scholars have characterised adversarial legal proceedings as unrivalled forums for publicly exploring the strengths and weakness of scientific and technical evidence. Examples include: the US Supreme Court explaining that 'vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible [expert] evidence' (1993); John Henry Wigmore's classic celebration of cross-examination as 'beyond any doubt the greatest legal engine ever invented for the discovery of truth'; along with Brian Wynne characterising adversarial courtrooms as 'pure institutionalized mistrust' (1989) and Sheila Jasanoff's discussion of legal proceedings acting as a type of 'civic education' (1995). This presentation brings together recent empirical studies that question the ability of legal actors and adversarial proceedings to successfully identify and explain strengths and weakness with scientific evidence. In the process it explains how legal institutions struggle to recognise these limitations and their implications for fairness and the accuracy of outcomes.

Transitioning from Detective to Scientist: The Translation and Reconstruction of Expertise in Fire and Arson Investigation *Rachel Dioso-Villa, Griffith University, School of Criminology and Criminal Justice, Griffith University*

With a steady stream of critiques by government institutions and academics, alongside the legal discussion of the reliability of the methods used by expert witnesses in the Daubert regime, many forensic disciplines are translating their practice into scientific expertise in the

mutual but unequal vulnerability, where abuse and harm can go in multiple directions. The wildlife center provides palliative care at a scale that collapses individual with species. However, the analogy ends when the palliative care of the rehabilitation center lacks comfort. The paper engages care workers' perspectives and stories of dying orangutans and is based on seventeen months of multispecies ethnographic fieldwork in Sarawak. It contributes to the robust literature in STS on animals, care, Asia, extinction, and capitalism (Choy 2011; Haraway 1989, 2010, 2008; Hayden 2003; Rajan 2006).

Becoming Flock *Anne Galloway, Victoria University of Wellington*

This paper presents an auto-ethnographic account of raising sheep, and its impact on the author's broader research in multispecies ethnography. Focus is placed on how insider/outsider perspectives play out in practice, and how best to (re)present the animals' dynamic relations with each other and with the shepherd/researcher. More specifically, creative and speculative works are presented as both research methods and research outputs — troubling traditional criteria of validity and opening a discussion around public scholarship and impact.

Messing with methods in mud with pigs and mangroves *Kate Judith, UNSW; Hélène Ahlberger Le Deunff, University of Sydney*

Thinking mud is something many humans are not well practiced in, but mangroves and pigs can do it well. We are making 'theory in the mud' (Haraway 2016) through allowing the practices of mangroves and pigs to guide us into the shifting, the multiple, the earthly, the sticky, the dirty and the dangerous of mud. Understanding pigs' practice of wallowing, and the accumulation and settling in mud of mangroves as grounded ways of being, mud lets us see these more-than-human worlds as sticky webs of encounters. Our studies take an interest in the muddy world making of pigs and mangroves as they rub against those human desires which locate cleanness, control and identity in opposition to muddiness. The mangroves of Sydney negotiate their world making around the margins not only of the harbour and rivers of the city but also of the human imaginings of these spaces. In the capital of Kiribati, pigs' mud weaves together modern and traditional waterworlds. In lurking with the mangroves of Sydney and the pigs of Kiribati we notice their accommodating, edge-seeking, space-shaping methods. Much of this adaptive and experimental practice incorporates quantities of discharges, toxins, and human practices. We have made particular choices about the tools, practices, theories and words we use to engage and think with our non-human collaborators. We find there hosts, guests, parasites, kin, co-producers and co-participants. In this paper we will share our own methodological journeys in engaging theoretical perspectives within mangrove and pig worlds.

Session Organizer:
Anne Galloway, Victoria University of Wellington
Chair:
kat Jungnickel, Goldsmiths

120. Bioeconomies - Life, Technologies, and Capital in the 21st Century I: Frictions, Values and Prospective Markets Across Global Bioeconomies
Papers for Open Panels/Bioeconomies – Life, Technology, and Capital in the 21st century
Open Panel
9:00 to 10:30 am
ICC: E5.8
This session will focus on the frictions, the valuation processes, the role of public institutions and politics in general in the creation, consolidation and unfolding of different bioeconomies, ranging from the health sector to the GMOs, from biofabrication to biomasses. It will address in details the complex articulation of imaginaries, policies and markets in the emerging web of global bioeconomies.
Participants:

Bioprospecting Networks and Biotech Knowledge Economies *Alberto Eduardo Morales, University of California Irvine*

Through in-depth interviews and participant observation, this paper traces and analyzes the stories and claims accompanying bioprospecting research practices in Panama's changing political and economic landscape. I examine the competitive and collaborative efforts that buttress scientific knowledge production among natural products researchers and advocates of science who are working to leverage Panama's biodiversity and emerging biotech sector. Bioprospecting or "natural products research" refers to the interdisciplinary work of scientists who seek potent chemical compounds for future drug development. In this multi-scalar, ethnographic study of bioprospecting, I explore the multiple meanings of scientific innovation, the circulation of knowledge, and the inter-institutional ecology assembling in the Republic of Panama to articulate a state-of-the-art, global scientific hub in today 's growing knowledge economy. My paper also examines how today's knowledge economy along with new conceptualizations and practices in bioprospecting science have ushered in changes in scientific knowledge production, particularly as Latin American scientists experience increased international mobility to develop expertise. I offer new insights of the processes of scientific knowledge production that push back on knowledge circulation as a social scientific model for understanding: 1) the assembling of institutions and the procuring of financial arrangements to fund scientific research; and 2) the imaginings and rematerialization of biodiversity, networks, ecology, and life. How are scientists changing bioprospecting practices and how are these changing practices impacting, and impacted by, the financial arrangements surrounding scientists? What are the funding sources? Are they public, private, mixed? How do various interests create these economic and scientific arrangements?

'Having a structuring effect on Europe'. The Innovative Medicines Initiative and the Construction of the European Health Bioeconomy *Luca Marelli, IEO*

Building on arguments advanced within constructivist research in the social sciences, this paper moves beyond the formal institutional structures of the EU and accounts for the mise en politique of the technosciences as a strategic site for the formation and (attempted) legitimization of a distinctively European identity. In particular, the paper probes how the intertwinement of biotechnology and capital that goes under the rubric of the 'bioeconomy' is increasingly being recruited to frame the basic elements of the European supranational order in–the–making. Unsurprisingly for a political entity that proclaims its embrace of a knowledge–driven economy,

the promissory expectations revolving around the bioeconomy have played a significant role in performing political and institutional reconfigurations throughout the continent. How, and to what effect, is what we aim to lay bare by specifically focusing on the revealing case study of the Innovative Medicines Initiative (IMI), the world's largest public–private partnership (henceforth: PPP) in the life sciences, and a mainstay of the European health bioeconomy sector. The paper is composed of three parts. First, we tease out different relevant strands within European public discourse that have propelled the construction of supranational imaginaries, and highlight the important role played therein by EU engagement with bioscientific research and innovation. Next, we introduce the European discourse on the bioeconomy, with specific regard to the biopharmaceutical sector, and expound its key tenets. Finally, we probe the latter through a case study-based analysis of IMI.

The Good Economy: From What The Bioeconomy Is To What The Bioeconomy Does *Kristin Asdal, TIK, Centre for Technology, Innovation and Culture; Béatrice Cointe, University of Oslo; Bård Hobæk, TIK Centre for Technology, Innovation and Culture, University of Oslo; Tone Huse, TIK Centre for Technology, Innovation and Culture, University of Oslo; Tommas Måløy, TIK Centre for Technology, Innovation and Culture, University of Oslo*

The bioeconomy is now both a theoretical concept and an empirical object for STS scholars. This warrants caution. For the bioeconomy, as a promissory construct, does not so much describe an external reality as it seeks to work upon it and modify it – and, possibly, also works upon us as scholars taking up the term critically. How then to approach it analytically and theoretically? Taking our cue from Charis Thompson's notion of 'good science', we propose 'the good economy' in order to carve out an academic space to approach this new economy, a space that is not already predefined – neither by the strategies and actors we want to observe and understand, nor by on-going scholarly debate. In fact, in keeping simply with the notion 'bioeconomy', we risk taking for granted precisely what we need to investigate: namely what kind of economy this is, what it does and with which means. Seeking to move beyond (if ever much needed) mapping of what the bioeconomy is and claims about how to study it correctly, we set out to examine how this new economy involves valuation practices in sciences, in markets and in policy – valuing life, the biological and resources in different and sometimes thoroughly conflictual ways. To study what the bioeconomy does, we first sketch a genealogy of the concept; then, we analyze coexisting versions of the bioeconomy as they appear in the EU, OECD and Norwegian strategies; and we relate this programmatic reflection to a series of ongoing empirical investigations.

The Networks we see vs the Networks we have: Key Actors and Discourses in Germany's Wood-Bioeconomy *Alex Giurca, Chair of Forest and Environmental Policy, University of Freiburg*

Previous studies on bioeconomy networks in Germany have been mainly descriptive and have tended to attribute certain network characteristics to particular forms of observed cooperation (e.g., innovation networks). Moreover, most of these studies are revolving around network structure and fall short of explaining qualitatively complex issues such as actor beliefs, strategies or underlying reasons for actor participation in these networks. The present study aims to reconcile some of these shortcomings and proposes a rethinking of the wood-based bioeconomy network (WBN). Through a series of semi-structured interviews with key actors in the network, this paper attempts to 'untangle' the WBN by putting greater emphasis on the discourse of networking and on the strategic content of networking as practice and process. Empirically, this study seeks to: (i) understand what is it that actors network about (i.e., the nature and scope of the WBN) and (ii) explore what kind of beliefs and strategies these central actors bring forward. Theoretically, the discussion endeavors to (partly) reconcile some elements of the old structure vs agency debate in network studies and systematically reflect on the relationship between network discourse and the practices of the 'observable' WBN.

The New Biopolitics of Eating: Meat Biofabrication and the Post-Animal Bioeconomy *Elisabeth Abergel, Université du Québec à Montréal*

The production of in vitro meat (IVM) involves the biofabrication of edible muscle tissues from stem cells. While the objectives of the post-animal bioeconomy are to disrupt the meat industry by producing clean, ethical and environmentally sustainable animal-free meat, it creates tensions and contradictions regarding the future of food and rural livelihoods. Cellular Agriculture, the production and design of existing foods from cell cultures, represents a new mode of technoscientific knowledge production, organization and practice. From an STS point of view, we will analyze how the possibilities of tissue engineering, material sciences, bioengineering and synthetic biology drive the animal tissue economy. Cellular Agriculture companies have no real-world connections to the traditional agri-food system or farming. Yet, their aim is to feed the planet and build a better agricultural ecosystem starting from a stem cells. Edible animal tissues contribute to increased scientific interaction with new forms of life while creating biovalue. In that sense, IVM follows the paradigm of intensive animal farming through its application of biotechnologies. This paper will present an analysis of the discursive strategies and the language used to promote ecological and responsible eating as well as how vegetarian/vegan/flexitarian/vatitarian communities, biohackers and tech billionaires get enlisted as consumers, drivers and investors in Cellular Agriculture. We will show that IVM not only essentializes the human need for consuming animal flesh, it creates a new biopolitics of eating as well as the domination over animal bodies by other means.

Conjuring bioeconomies through frictions *Pierre Delvenne, Université de Liège (SPIRAL)*

Bioeconomy as a political-economic project generates and performs distinctive distributions of value, power and agency. Under neoliberalism, bioeconomy not only turns nature and knowledge into new fictitious commodities (Pavone and Goven 2014, 2017), it also triggers fictional expectations about the future (Beckert 2016). As a narrative package, however well dramatized, the bioeconomy project cannot simply take over the world. To be effective, it needs to be activated and enacted in different and contradictory ways. Following Anna Tsing

(2004), I argue that bioeconomy is made through "friction" between a global project originating in Western conjuring centers (European Commission, OECD) and "the sticky materiality of practical encounters" at the peripheries. Focusing on the case study of genetically modified (GM) soy in Argentina, I will analyze bioeconomy as a site of struggles, as much to make sociotechnical futures as to recapitulate the past. In my situated inquiry of agricultural bioeconomy in Argentina, struggles materialize in attempts to re-think agriculture as-we-knew-it, and to re-name it as "agro-industry" (Delvenne 2017). The presentation will explore these developments as evidence of an attempt to reject the idea of agriculture as the reactionary stronghold of a backward bourgeoisie and instead embrace agriculture as generative of an industrial avant-garde that promises political-economic transcendence. I will conclude with stressing theoretical and methodological challenges for STS scholarship to carry out ethnographies of global connections within and across bioeconomies.

Session Organizer:
Vincenzo Pavone, Consejo Superior Investigaciones Cientificas (CSIC)

Chair:
Sara Lafuente Funes, Institute of Public Goods and Policies (IPP) - Spanish National Research Council - CSIC

121. Post-Cyber Feminism: Mutations in Australian Feminist Technoscience
Papers for Open Panels/Post-Cyber Feminism: Mutations in Australian Feminist Technoscience
Open Panel
9:00 to 10:30 am
ICC: E5.9

Australia has a rich history of feminist critique and engagement with science and technology. From the VNS Matrix' Cyberfeminist Manifesto to Laboria Cuboniks' Xenofeminist Manifesto, Australian feminists have been at the forefront of experimental and radical scholarship and practice. While concepts from cyberfeminism and xenofeminism are now transnational, their uniquely situated histories within genealogies of feminist technoscience warrants further engagement. This open panel invites papers reflecting on Australian feminist technoscience "post-cyber feminism." What mutations have occurred over time? By mutation, we refer to the transmission, variation and corruption of ideas and approaches to "doing" feminist theory and practice. Mutations call to attention changes in situated material contexts, in this case, the specific material-semiotic assemblages of time/place/people/events we call "Australia." The questions we seek to address include: What are the uniquely Australian histories of feminist technoscience? How do these intersect with other forms of Australian feminisms, such as Aboriginal, postcolonial, queer? How can we think "xeno" politics in a settler-colonising society? How do seemingly disparate movements in contemporary art, fiction, philosophy, and feminism draw on, respond to, and critically resist Australian cyberfeminism, and how has Australian cyberfeminism mutated in response to these? How have changing political, material, and technological conditions altered the field of cyberfeminism, perhaps necessitating the expanded taxonomy of what Helen Hester recently called "post-cyber feminism"? We seek both traditional conference papers and contributions that loosen or discard the conference paper format altogether: science-fiction, performance art, poetry, philosophy, and all other mutations.

Participants:

A SPELL TO BIND ALL MALE CONFERENCE PANELS: A site specific performance/paper *Linda Stupart, University of Reading*

A site-specific performance/paper The virus' life is continual reproduction, and so she festers, feeds, multiplies in the technologies of Oedipal teleologies father fucking father killing daddy daddy oh daddy Oh! Oh! Oh! Every time a white man born a man cites a man born a man cites a man again every time a translucent male artist or academic or scientist references another pallid male academic, artist or scientist – in this most sterile shallow procreative model, she proliferates. In every screen, in every projector, ever lecture theatre hub, Virus grows new tentacles, legs, cunts, arms with balls on the end like the viruses that used to be in science class when there were still classes and when they still insisted on believing in science, and objectivity - that is men's ability to make objects of the world. Situated at a major conference, the performance, or live casting, of 'A Spell to Bind All Male Conference Panels' enacts an embodied, magical form of knowledge production and protection from masculine futurity. In particular the performance presentation critiques and acts against the proliferation of all-male groups of academics and scientists proffering, and producing 'the future' in terms of technology, embodiment, and affect. The spell casting features elements of technopaganism – remote controlled candles, electronic music, powerpoint; more traditional magical elements – a salt circle, moss, thread; karaoke; and anger, to power a spell to stop the speech of all-mall conference panels. The spell will be shifted according to conference panels, assertions, and feelings at 4S, and will feed on and react to primary research at the 4S meeting speaking with women, non-binary and queer scholars present about their experiences of masculine authority in social and other studies of science, particularly futurisms.

Big Mother Infrastructures: The (Il)Logics of Invisible Provision *Zoe Sofoulis, Zoe Sofoulis*

This paper draws on insights into the (il)logics of invisible infrastructures gained over four decades of work on gender, culture and myths of high-tech masculine maternity, starting with techno-wombs like computers, space ships and shopping centres, and more recently focussing on urban water. A pivotal point is 'Container Technologies'(2000), an essay concerned with indebtedness to invisible infrastructures as part of the logic of 're-sourcing', turning the world into a resource stockpile (Heidegger's Gestell). Parallels are drawn between industrial scale provisioning and the household labours of reproduction, as understood through feminism, Marxism and the psychoanalysis of intersubjective relations. This is no interpretivist fantasy: women in effect are the infrastructure in many poorer nations, labouring to collect fuel and water in the absence of technical infrastructures that have come to be taken for granted in my (first) world. But the continued 'smooth functioning' of Big Mother's invisible infrastructures is no longer assured. In Australia, water infrastructure is ageing, electrical grids may get overloaded, the National Broadband Network is a frustrating joke; meanwhile rooftop solar energy and rainwater collection engage residents as active 'prosumers', and 'daylighting' infrastructures is tentatively considered. As a recent investigation of public trust in Sydney's drinking water

found, deliberately keeping infrastructures invisible allows water providers to brand their product as 'pure' and 'natural,' but residents from countries where piped water is known as an industrial product would be more reassured by publicity about technical and chemical water treatment facilities.

Alien Nation: Tracing The Other in Xenofeminism *Xiaoran Shi, Independent scholar*

How does xenofeminism accommodate the racialised Other/s in the material-semiotic landscape we call "Australia"? When the xenofeminist manifesto predicates itself as a politics of alienation striving for freedom against the tyranny of the "natural" order, it aligns itself with the interstitial subjectivity of the ethnic Other, who is necessarily alienated and whose very existence poses a threat to the settler-colonial constitution of nationhood. Given that the "natural" citizen in this formation of nationhood is Anglo, the ethnic Other is by default an aberration. Thus, we see a discursive alliance between xenofeminism and anti-colonial politics. But, their parallel objectives betray parallel obstacles. Xeno/cyberfeminism has struggled to articulate a positive account of its identity and agenda, and has offered instead reactionary principles as exemplified in the "100 anti-theses" presented at the first international Cyberfeminist alliance. Similarly, anti-colonial politics is defined by its "anti-" position and although it offers some possibilities for a post-colonial future, it is yet to configure the non-Anglo as anything other than Other. So, in summary, this paper will explore how the gendered Other and the racialised Other can go beyond their Otherness; carry through their alienation and produce an emancipatory politics that embraces artifice because nothing in our social field is "natural".

Between// Around *Nicholas Brocchi, Griffith University*

This paper will be presented alongside my 2017 video work between// around. Engaging in queer as a politics of fluidity, viewing fluidity as any subject without the privilege to a fixed and visible economic, medical, legal and cultural institutional identity. This lack of representation directly causes a subject to be in a constant state of flux, while remaining invisible or being read as performed. Queer has fundamentally sat at the intersection of race, class, gender, sexuality and differently abled bodies. As our communities gain institutional recognition we can learn from collectives such as the VNS matrix who utilized public and gallery space to contribute to the open sourcing of feminism, allowing for a range of identities to occupy space within the feminist subject. The collective effectively deployed their jouissance by going to source of their oppression and turning that into the very tools of their agency. We todays contemporary queer communities can learn from this, by turning the epicenter of how we are constructed within a heteronormative context, which is to be reduced to a particular set of identity politics and turn that into queer as a politics that refuses to essentialize a particular identity.

Creative mutations: queering cyber-feminisms in artistic research *Anna Helme, University of Melbourne*

In this multimedia paper I present my artistic research on queer feminist moving image making praxis, in which I argue that queer and feminist subjectivity, political affinity and sociality are imbricated in contemporary queer feminist moving image practice. I include material from the first mutated hybrid of creative practice, social movements and scholarship in my short film MyMy, a science-fiction/documentary about a queer cyborg, my personal approach to radical scholarship (HOT GOSSIP) and moving images hybridising queer/feminist social media and narrative fiction from my doctoral research.

Flesh Machine and Mutant Bodies: Lab-Grown Life in Australian Feminist BioArt *Elizabeth Stephens, University of Queensland*

This paper will examine recent works in Australian feminist bioart—by Nina Sellars, Svenja Kratz and Tarsh Bates (amongst others)—which reflect critically and creatively on the relationship between life and technology at the start of the twenty-first century. It will consider the contributions these works have to make to recent scholarship in feminist science studies, and particularly Australian feminist science studies. The work of the lab-based artists examined in this paper asks important questions about what it means to care for organisms we usually try to eradicate (like candida), or how we might include within the anatomical imaginary bodily matter that has traditionally been excluded from it (like fat), or how to recognise the people and animals now reduced to immortal cell lines in petri dishes, the ghosts of the modern laboratory. This paper will examine the central role mutant bodies and lab-grown life occupy in Australia feminist bioart, as hybrid semi-living techno-organisms, and argue that mutation here is deployed as a critical and creative methodology by which to intervene in the contemporary rhetoric and practice of bioscience.

Session Organizers:

Thao Phan, University of Melbourne, Australia
Sally Olds, University of Melbourne
Emma Black, University of Queensland

Chairs:

Sally Olds, University of Melbourne
Emma Black, University of Queensland
Thao Phan, University of Melbourne, Australia

122. The Invisible Aspects of Infrastructure 2: Privacy, Security, Surveillance

Papers for Open Panels/The invisible aspects of infrastructure
Open Panel
11:00 to 12:30 pm
ICC: C2.1

Infrastructure has long been of interest to STS scholars – different types (transport and communication), studied from different perspectives (historical, economic, ethnographic). One standard definition is that infrastructures are only noticed when they do not work, but much infrastructure is very present – it's hard to miss road and rail networks, and digital networks depend on massive investments in cables, satellites and servers. In this second session (of two), we focus on digital infrastructures and how they are entangled in questions of privacy, security and surveillance. Despite the globalising affordances of digital technologies, we know that they are taken up in local settings, often in very different ways. We also know that privacy, security and surveillance mean very different things in different contexts. This session opens up discussion about these differences, by bringing together insights from STS about socio-technical ensembles together with ideas from (Marxist) sociology and political economy, and with contributions from around the world. Presenters and audience members are invited to reflect on the meanings of privacy, security

and surveillance, and how they are challenged by the increasing pervasiveness of digital infrastructures.

Participants:

Demonstrating Cyber Security: Making Invisible Breaches Visible *Jessamy Perriam, Open University*

Citizen-consumers use digital infrastructure to conduct everyday, mundane and domestic tasks. These activities are on the increase with the introduction of the Internet of Things products and their associated data and infrastructure. However, the cyberbole (Woolgar 2002) surrounding Internet of Things devices and the promise of increased convenience for citizens-consumers has overshadowed the risks involving the cyber security of devices and their infrastructure. I argue the risks of breaches around the internet of things and infrastructure more generally are not made visible enough to citizen-consumers to enrol them in cyber security maintenance practices - such as software updates and passwords - with price and ease of use over-emphasised. This in part leads to cyber attacks such as the Mirai DDoS attack and the WannaCry attack. These attacks disrupted infrastructure for websites, web services and platforms and - in the case of the WannaCry attack - caused disruption to the UK's National Health Service. This paper uses research based on qualitative analysis of YouTube videos and blogs from cyber security professionals, government departments and manufacturers to argue that the level of problem amplification (Latour 1999) around these issues tend not to translate into material practice for citizen-consumers, who are ultimately responsible for the maintenance work of their individual cyber security. How might the main actors in the Internet of Things and cyber security space better demonstrate the risks of lax cyber security? How might future demonstrations of cyber security breaches attribute agency to citizen-consumers to enrol them in maintaining their own pieces of infrastructure?

Probing the Political-Economic and Social Dimensions of Present Information Technology Development in Mainland China *Michael Unger Kowen, UC Berkeley Department of Sociology*

This paper aims to better grapple with the political-economic and social dimensions of the recent and continued development of information technologies (with a particular focus on artificial intelligence and "big data") in the People's Republic of China (PRC). It does this by way of presenting findings from interviews with managers and developers at a diverse array of Beijing-area companies working in the information technology sector. On the basis of these interviews, my paper suggests elements of how professionals working in the tech sector of the PRC perceive: 1. The broader significance of these technologies in China and on the global stage; 2. The possible risks (e.g. to individual privacy and informational security) inherent in the implementation of these and related technologies; 3. Their products and their products' development in relation to public authorities. Through studying the perceptions of key actors in the current development of these technologies, my paper contributes to a keener sense of the directions and stakes of these technologies in China today, especially with respect to how these technologies may relate to the state. Further, because of its particular theoretical and methodological starting place, my study also offers an example through which to think critically about how human scientists might grapple with the social, political and economic interrelations of presently emergent technologies beyond the single case in question.

The Other Computing Counterculture: Community Memory's Public Computing Terminals *Joseph Richard DeLeon, University of Michigan*

My paper analyzes the infrastructure of public computing terminals of the Community Memory (CM) project in California's Bay Area throughout the 1980s and early 1990s. My research of archival materials of the CM project at the Computer History Museum in California reveals an important moment in the development of idealist visions of networking infrastructure. CM's infrastructure consisted of computing terminals at public locations such as laundromats, senior centers, and activist spaces. I argue that this project demonstrates how early ideas of the Internet did not only view the potential space of the Internet as an unbounded public utility, but that the technology workers of the CM project built the hardware to also provide rudimentary, equalized access to early forms of local networking for all. The aim of the CM project was to construct an alternative infrastructure before, in one CM staffer's words, "the thing that we're the alternative to has become pervasive." Such a goal is relevant to contemporary discussions of the maintenance of historically layered infrastructures over time. My paper analyzes the debates over the construction of the terminals—including how to market the class orientation of the project and the physical design of the terminals themselves—in order to show how the CM project constructed an infrastructure of networked community decades before social networking platforms have made such infrastructures commonplace. The visibility—to STS discussions—of other "amateur" networking groups such as the Homebrew Computing Club has overshadowed the CM project and its important alternative infrastructure of networking.

Session Organizer:

Tim Jordan, University of Sussex

Chair:

Sally Wyatt, Department of Technology and Society Studies, Faculty of Arts and Social Sciences, Maastricht Univer

Discussant:

Tim Jordan, University of Sussex

123. TRANS-disciplinary Research Through STS Practice Part 2

Papers for Open Panels/TRANS-disciplinary research through STS practice: The co-creation of knowledge and collaboration

Open Panel

11:00 to 12:30 pm

ICC: C2.2

STS has a key role in helping to create transdisciplinary research programmes that encourage collaboration and shared knowledge creation. Transdisciplinary research programmes are needed if we are to address the greatest challenges of our times, such as climate change. In attempting to understand the process of transdisciplinary research, we must first come to terms with different forms of knowledge. In the creation of transdisciplinary research programmes, such as the New Zealand Government's National Science Challenges, what makes these collaborations effective, productive and satisfying programmes for all participants? How do different experiences and understandings of the world, such as indigenous knowledge and neoliberal governmentalities interact and co-exist in transdisciplinary

research? How can pre-existing ideas (disciplinary concepts or policy) that may underpin transdisciplinary research be re-configured to respond to current social, economic and environmental issues? This panel seeks to explore how knowledge is co-created within transdisciplinary research through STS practice, and it seeks to examine the opportunities, challenges and the reality of engaging in transdisciplinary dialogue and collaboration to create meaningful change in our world.

Participants:

Doing Narrative Science - A TRANS (disciplinary) strategy *Greg Williams, PO Box 8*

The doing of sciences in places at the margins of modernity, where different epistemic cultures meet, requires a careful rethink of scientific practices, both the premises upon which those practices are founded and sciences' means for presenting their understandings and findings. Doing sciences at the margins requires us to attend to the assumptions we make when we practice our professions. It also requires reorientation of the way we approach both the actual doing of science and the communication of scientific knowledge to people whose assumptions, experiences and practices are different to our own. This paper seeks to examine the role of narrative in the doing of science and how a recognition and respect for narrative might help in the process of being more inclusive in our professional practice. A 'narrative science' may or may not change the methods involved in gathering and interpreting scientific knowledge, but it does seek to help us rethink our relationship to their use and recognise the cultural, social and constructed nature of our work. It opens a space for alternative ways of thinking and interpreting what we see and responding to the knowledge-making we do.

Evolutionary Thought and Transdisciplinary Practices *Chessa Adsit-Morris, University of California, Santa Cruz*

My paper will discuss a research project aimed at establishing transdisciplinary research tools and methods to creatively explore existing systems of meaning-making (social, cultural, political and aesthetic), critically analysing normative conceptions of evolution founded upon human exceptionalism and competitive individualism, and restructure our collective imaginations. Darwin's theory of evolution is described as one of the major philosophical "decenterings," placing humanity in the midst of all other creatures. Yet we are now entering a new epoch—the Anthropocene—placing humans once again at the center, as the main causal force of change. It seems that Darwin's decentering of the human did not stick. There have only been a few scientists/scholars who have proposed alternative (re)interpretations of evolution, and even fewer able to extrapolate the significance into other disciplinary fields—Margulis's sybiogenesis, Carla Hustak and Natasha Myers's involutionary momentum, Deleuze and Guattari's creative involution, and Elizabeth Grosz's work on sexual selection. Challenges to such transdisciplinary work include deeply rooted institutionalized structures and disciplinary practices, as well as limited funding resources, which don't allow for the extra space and time needed for translation, negotiation, and dialogue. Indeed, currently such work requires scholars to already be literate and knowledgeable in multiple fields and disciplines of research. Drawing on current research in eco-evo-devo biology, working with the Center for Creative Ecologies at UC Santa Cruz, my

research focuses on establishing transdisciplinary research collaborations—drawing together scientists, philosophers, artists and cultural practitioners—in order to create new conceptual, theoretical, methodological, practical and translational understandings of evolution.

Māori Views on Novel Biotechnologies for Controlling Pest Wasps in Aotearoa-New Zealand *Ocean Mercier, Victoria University of Wellington*

In Aotearoa New Zealand, research is underway into five different biotechnological controls of German and Common wasps, such as pathogen-carrying wasp mites and gene-edited wasp queens. These have the potential to eradicate introduced wasps. The National Science Challenge project that funds this research asks which are considered 'socially acceptable', and thus suitable to consider developing further and using? Our study as a whole explores the perceptions of different groups of people, with a focus on Māori. This presentation will focus on a group of critically engaged and informed students of Māori Resource Management, whose undergraduate assessment included reflective geo-journaling on their own interactions with wasps, and research into wasp bio-controls. Focus groups, Likert Ranking exercises and a Q-Method sorting exercise canvassed participants' views in relation to 'wasp biocontrols'. The study found multiple areas of consensus, and also three groups with distinct viewpoints; reflecting both the unity and diversity amongst Māori. We will present these positions and views regarding the specific biotechnologies and explore how Māori values guided these. Finally, we will situate these within discourses of mātauranga Māori (traditional ecological knowledge) related to pest control, earlier debates on Genetic Modification, and in relation to the New Zealand government's goal to eradicate rats, stoats and possums from New Zealand by 2050. Implications for trans-disciplinary dialogue in pest management spaces will also be considered.

The influence of science funding agencies in fostering the co-creation of knowledge for use *James Arnott, University of Michigan*

Barriers across the complex science-policy-practice interface constrain the forms and quantities of engagement that may be necessary to connect scientific knowledge with implemented solutions to problems such as adaptation to climate change. Funding agencies have been identified as one possible driver of change, and in recent years funding programs like Future Earth have developed to intentionally foster co-produced research aimed at societal transformation. Yet, few multi-year studies have been conducted to understand how science funding program designs can influence both the practice and use of research. To contribute to this gap, this study examines applied science projects funded through the US National Oceanic and Atmospheric Administration's National Estuarine Research Reserve System from 1998-2014. Changes in the structure of this funding program, including escalating requirements for end-user engagement, offer a natural experiment from which to explore hypotheses about the how program design influences research practice, utilization, and other impacts. Interviews of project team members, end users, and program managers (n=40) supplement content analysis of project reports (n=120) to provide a large

database that is the basis for both qualitative and quantitative analysis. Results illuminate how funder mandates significantly influence the intensity of interaction between researchers and practitioners as well as affect long-term change in research cultures. When interaction intensifies, corresponding gains appear in the direct use of research results. However, throughout the assessment of this research program, many indeterminacies persist, which signal the need for improved evaluation methods for collaborative research.

Session Organizer:
Ruth Berry, BRANZ

124. Doing Cosmopolitics: Exploring Everyday Potentials Within STS Research
Closed Panels
Traditional (Closed) Panel
11:00 to 12:30 pm
ICC: C2.3

In recent years, 'Cosmopolitics' has experienced a renaissance within STS and anthropological scholarship. Beginning to question cosmopolitan politics as a straightforwardly desirable democratic ideal, new forms of relational analysis engaging disparate world-making practices are gaining prominence. Isabelle Stengers has proposed slowing down in the face of proliferating global social and environmental challenges. Bruno Latour has suggested that a common world must not be assumed, but is something to be slowly and carefully composed. While Mario Blaser and others have taken issue with assumed Western visions of both 'cosmos' and 'politics', to raise questions about how disparate entities and interests may work together without requiring consensus as an outcome. In this session, we are interested in 'doing Cosmopolitics' as a mundane and everyday activity involving disparate practices of knowing and governing. Drawing together four presentations and two commentaries (de la Cadena and Verran), we present papers which explore the experiential grounds of cosmopolitical inquiry; working through these investigations we seek to explore new possibilities for Cosmopolitics in STS research.

Participants:

Karrabing Filmmaking and the Aesthetic of Survivance
Elizabeth Povinelli, Colombia Univeristy

The cosmopolitical of Indigenous Artistic intervention *Britt Kramvig, University of Tromsø*
In Sápmi, Sámi artists are taking the lead in environmental controversies regarding governance of reindeer herding, land and waters. Ontological disagreement are enacted through Art-Science-Political mobilizing projects like "Pile of Sápmi" and "There is no Postcolonial" challenging governmental politics regarding Sámi interests. In December 2017 the Sámi artist Máret Anna Sára and the Norwegian artist A K Dolven, did several artistic interventions in front of the Norwegian Parliament while Máret's brother, Jovsset Ánte Sára sat in the Supreme Court. He was challenging the Norwegian states legitimacy to govern the size of his reindeer herd, as well as who and how nature best can be conserved. This are sparking a new political movement that challenge the foundation of both the modern state and the regional governmental body Finnmarkseiendommen by confronting the binaries embedded in its legal and political entities and modes of knowing. The division of Nature – Culture, Politics – Art but also Indigenous - Not collapse through these new mobilization against injustice.

In this paper, I will take these chains of events as well as the way I have learned to know and live with the multiple earth-beings of Sápmi, as the ethnography from where to investigate the awareness that cosmopolitics offer the academic as well as political communities.

Surrendering to the pull, inhabiting subterranean water worlds
Andrea Ballestero, Rice University
Water movement has been used to produce analogies and metaphors of social relations, exchange processes, and the global circulation of capital, people and nature. Under the guise of flows, an apparently unfettered movement of substances and beings has captured much creative and analytic energy. But a crucial flow which requires alternative thinking coordinates has been mostly left unexplored: the underground movement of water. Here I am not referring to the circulation of water through human-made infrastructures but to its dislocation across the dense time-space of underground geologic formations. This is not movement across space, but through rock, clay, and stone in time. In this paper I explore the qualities of that peculiar type of movement; one that resists dreams of infrastructural direction and discretion, and is, from the get go, caught up in the architectural density of its geologic substrate. To do so, I explore a particular ethnographic moment: the initiation of the layperson in hydrogeological thinking, that is, the invitation to inhabit subterranean worlds. I analyze the work of hydro-geologists from the National Water and Irrigation Service in Costa Rica and think sympathetically with their modest, and somewhat dated experimental methods, to imagine and communicate the existence of active flows in subsurface formations. More broadly, I query what are the politics of making the subsurface fluid at a time when fears of water crisis hover over our imaginaries of the future?

Feeling our way: Experiential practices of Cosmopolitical inquiry *Endre Dányi, Goethe University, Frankfurt am Main; Michaela Spencer, Charles Darwin University*
This paper draws on our experience of teaching and researching in which we sought to better understand cosmopolitical inquiry, and feel our way towards articulating how such inquiry might extend STS analysis. During a research project situated in the remote community of Milingimbi, we participated as ethnographers invited into a water management research team at the last minute. At a workshop where hydro-geologists and Yolngu Traditional Owners discuss potential futures for Milingimbi's water infrastructures, we witnessed work which actively sought to bring together different worlds, as well as much knowledge work which exceeded each side's capacity to attend. While teaching in classrooms in Frankfurt (one of us in-body and the other on the screen) we presented ethnographic stories to new Masters students. We juxtaposed these stories with STS texts (Latour, 2004; de la Cadena, 2010; Verran, 2002) in working with students, to induce a reflexive 'feel' for intersections in knowledge work when different worlds meet. Juxtaposing these stories of these experiences, we foreground differing means for holding together radically different knowledge practices that come to life and the political institutions that participate such settings. Through articulating these experiential examples we attempt to adduce a vague notion of cosmopolitical inquiry and suggest several

possibilities for enriching and expanding approaches in STS analysis.

Session Organizer:
   Michaela Spencer, Charles Darwin University

Discussant:
   Helen Verran, Charles Darwin University, Casurina, NT

125. Racialised Bodies and Knowledges
Single Paper Submission
Open Panel
11:00 to 12:30 pm
ICC: C2.4
Participants:

Sequencing Profits, Race And Identity: An Analysis Of Direct-To-Consumer Genetic Testing Of Ancestry *Hined A Rafeh, Rensselaer Polytechnic Institute*

In 2013, the Food and Drug Administration sent a warning letter to the genetic testing company 23andMe, demanding that they cease marketing for the unauthorized Salvia Collection Kit and Personal Genome Service. Following the suspension of their health-related genetic tests, 23andMe was the spotlight of many conversations of medicine, bioethics, and politics. However, this paper focuses on the rise of the ancestry testing that coincidentally became the company's main product. This work explores how the commercialization of direct-to-consumer (DTC) genetic testing for ancestry and ethnicity. In the databases of many DTC genetic testing companies, ethnic groups are categorized as 'reference populations', 'population clusters' and 'founder populations'. What role do these classifications play in the future of race and identity politics? In studies of race and science, we have seen how certain ethnic groups use and respond to DTC genetic tests in regard to identity (Tallbear, 2013; Nelson 2016), and this work aims to further this ongoing conversation. This research investigates the ways in which genetic ancestry testing services, like those offered by "23andMe," are shaping and are being shaped by members of ethnic populations targeted by DTC companies, whose epistemic frameworks of race, ancestry, and identity are radically different from those that underpin the racial categories in genetic testing. This work will analyze how seemingly objective scientific data and practices can have profound political and social effects on current and future conceptions of race and identity.

Difference and Disease: Medicine, Race, and the Eighteenth-Century British Empire *Suman Seth, Cornell University*

In 1735, the former naval surgeon John Atkins penned what must be considered one of the more striking understatements of his age. In A Voyage to Guinea, Brasil, and the West-Indies, he described the difference between the physical appearance of the inhabitants of Guinea and that of "the rest of Mankind": "tho' it be a little Heterodox," he acknowledged, "I am persuaded the black and white Race have, ab origine, sprung from different-coloured first parents." Polygenism was, of course, considerably more than a little heterodox. Unusual in his polygenism, Atkins was also unusual both in spending very little time in relating his heterodoxy to Biblical views and in proffering his most detailed remarks within a medical text. The fact that Atkins espoused polygenism in the same work in which he described diseases peculiar to native Africans led one of the few

scholars to consider his texts in any detail to suggest that one might find "connections between concepts of race and concepts of disease." That Atkins gave up on his polygenism in a later edition of the Navy-Surgeon (1742) without significantly changing his etiological understanding leads me to the opposite conclusion. In the 1730s, I suggest, environmentalist understandings of physical difference were beginning to change. Environmentalist understandings of disease, however, particularly with regard to the diseases of warm climates, were not. Atkins provides us with a fine example of a trend that would continue for the majority of the century: the widening gap between 'race-science' and 'race-medicine.'

From Boundary to Folded: the Spatial/Temporal Movements of Anthropometric Measurement Technologies and the Interfolding of "Race" and "Caste" *Thiago Pinto Barbosa, Leibniz-Zentrum Moderner Orient*

My paper explores new ways of thinking the movement of scientific objects through a topological material-semiotic approach that brings into focus not only their spatial travels but also the layered temporalities. Based on a historical anthropological research case, I trace the movements of an anthropometric measurement technology, the anthropometer, from its "invention" in late 19th century in Switzerland, to its uses along the following century in practices of knowledge production in and between Germany and India. More precisely, I follow the use of this inscription device by anthropologist/sociologist Irawati Karvé (1905-1970), both during her research on racial differences in Berlin and during her research on "the racial" of "castes" and "tribes" in different settings in India. Beyond functioning as a boundary object across communities of practice, I argue that the measurements produced by the anthropometer can be better understood as a folded object (M'charek 2014). With this concept, we can grasp the complex relationality in the anthropometric makings of "race", "caste" and "tribe" across different spatial and temporal contexts - even when "race" becomes less present. Thus, having in mind the historicity of anthropometric measurements as a folded object and of the technologies thereby involved, I analyze how "caste" and "tribe" were enacted – and, as an effect of this practice, become racialized. In this sense, my paper proposes a more attentive engagement with the temporalities of such scientific objects, thereby contributing to the understanding of the transformation of racialized knowledge in its long travels across time and space.

Hair, Hormones & Ghosts: How Race is Submerged in Polycystic Ovary Syndrome *Elizabeth Carlin, CUNY Graduate Center; Brandon Kramer*

Contemporary public health initiatives have prioritized research that addresses both health disparities and post-genomic innovation. Race is often medicalized as an independent risk factor for disease outcomes, and it is typically included in studies without theoretical justification, consistent criteria or even clear definitions. In polycystic ovary syndrome (PCOS), racial and gendered assumptions about testosterone and women's hairiness are part of the diagnosis itself. While gendered preoccupations about hormones are well established in STS, both testosterone and hair also have long histories of

misuse as markers of racial difference. Drawing from Star's seminal concept, we trace how researchers triangulate measures of circulating androgens and body hair to define PCOS. Starting with the gold-standards of evidence-based medicine, we evaluate the claims and evidentiary practices that link women's perceived hairiness (hirsutism) to both racial difference and testosterone levels. Researchers rarely make the direct link between testosterone and race explicit. However, despite ambiguities and inconsistencies in the evidence linking testosterone levels to hirsutism and hirsutism to race, the assumed racial character of testosterone forms the "ghostly linkage" that animates and bolsters these claims. While not enacted as a diagnostic criterion, metabolic risk has become an organizing principle for PCOS. Through its link to hirsutism, race becomes a risk factor for PCOS, which is glossed in turn as a risk factor for metabolic disease. By constructing an attenuated causal chain from race to disease, the literature recirculates but submerges racial claims, rendering them implicit but actionable.

Session Organizer:
   Hined A Rafeh, Rensselaer Polytechnic Institute
Chair:
   Hined A Rafeh, Rensselaer Polytechnic Institute

126. Trans-organisational Collaboration in Different Sectors: Epistemic Values and the Dynamics of Co-production
Papers for Open Panels/Trans-organisational collaboration in different sectors: epistemic values and the dynamics of co-production
Open Panel
11:00 to 12:30 pm
ICC: C2.5

The aim of this panel is to explore the co-production of research agendas in inter-organisational public/private relationships. Co-production here reflects two processes: increasing epistemic and organisational practices between public and private sectors as new science and technology platforms develop, and state-driven programmes that are based on mobilising public science for accelerated innovation and wealth generation. In this panel we ask how such co-production is reflected in the metrics used to assess the value(s) of co-produced science. The papers consider this issue in different science and technology sectors and show great variation in how co-production takes place. In the spirit of the conference the panel explores this issue within and across different national contexts, thus contributing to STS debates and those working in innovation science and technology policy analysis.

Participants:
  Competition and the Transformation of Academic Labs in Biomedical Sciences in the 1980s *Annalisa Salonius, Independent Scholar, formerly University of Pennsylvania*
  The debate in STS about how the academic life sciences have been changing since the late 1970s in both Canada and the U.S. has focused primarily on the influence of the increasing commercialization of academic research and enhanced university-industry ties. This study examines an episode that challenges the assumption in this debate that the organization of academic labs during this period has remained essentially the same: the emergence of larger academic labs in the biomedical sciences. Based on evidence of changes in practice revealed in work history interviews with older and retired professors done during a larger ethnographic study of work in academic labs, the

main argument is that dependence on federal grants and a key shift in the nature of competition for those grants during the 1980s led to a transformation of the social organization of work in this field, including the emergence of larger hierarchically-organized labs. The implications of these findings for understanding the role of the contemporary academic scientist in this field are also discussed. The contribution of this paper to STS is to show that, contrary to assumption, there has been a significant reorganization of work in academic labs in the biomedical sciences since 1980, and how this is related to the political economy of science. Biomedical research, academic labs, research funding, competition, political economy of science

  Connecting People, Things and Values: Public/Private Research Relations *Jane Vedel, Copenhagen Business School; Andrew Webster, University of York*
  This paper explores how large research grants from private foundations change research practices. Of special concern is how these grants enable new relationships to emerge (interdisciplinary and/or public-private), alter the trajectory of the research (and the PI), and affect the temporal organization of the research, introducing new temporalities and linking several temporalities. Comparing private grants with research funding from public research foundations and institutions the paper also considers the accountability that these grants introduce, both in terms of reporting project outcomes and values and in terms of the flexibility to change the direction of the research in the course of the research process. We relate these questions of accountability to the current trend among funding institutions to seek to define, collect and analyse data that reflects the diverse values and impact their funding is intended to foster. The paper is based on an ongoing research project which investigates the role of the private sector in research-based education. This paper contributes to debates on translational dynamics within basic/applied contexts as explored by STS, science policy studies, and organization and management theory.

  The Challenges and Potential for Collaboration between Wind Energy Scientists and Engineers and Environmentalists *Nicolas Hernandez, The University of Texas at El Paso*
  The Environmentalist identity is addressed in a variety of ways within the wind energy industry. This study examines internal, expert-to-expert communication of wind energy professionals to elucidate way they both identify as environmentalists and characterize environmentalists outside their industry to identify possible challenges and opportunities for collaboration between the wind industry and environmentalists. As one might expect, wind energy scientists and engineers tend to self-identify as environmentalists. This is largely articulated though concerns over wildlife health as well as ambitions to further renewable energy resources to mitigate climate change. However, this study found that wind energy scientists and engineers characterized environmentalists both positively and negatively. Furthermore, they characterized environmentalist positively when environmental advocacy complements scientific reasoning and supports the wind industry. By studying how wind scientists and engineers compose their views of environmentalism we found instances of harmony and tension which may contribute to or limit

future collaboration between the wind industry and environmentalist at large. Better understanding this discursive move by wind energy professionals has the potential to improve energy professionals and interested members of the public.

Research Policy As Industry Policy: Reconfiguring Scientific and Social Value(s) in Australian Medical Research *Georgia Miller, UNSW; Matthew Kearnes, Environmental Humanities Progarmme, School of Humanities and Languages, University of New South Wale; Declan Liam Kuch, UNSW*

State-backed efforts to promote biomedical innovation frequently tout hopes for both improved health outcomes and opportunities for wealth creation. Yet the implications of the growing emphasis on industrial development aims within health and medical research policy remain comparatively unexamined. We argue that notions of social value in health policy, and of the criteria by which scientific merit should be judged, are being profoundly reconfigured as health and medical research is recast as innovation science. The paper explores the transformation of metrics of scientific and social value in the recent introduction of a major new research policy and funding instrument adopted by the Australian Federal Government, the Medical Research Future Fund (MRFF). We appraise key attributes of the policy and of the debate that surrounded its introduction, paying close attention to the enactment of value(s) that both effect. We conclude that the MRFF treats industrial development itself as a public good, while foregrounding commercial potential in the evaluation of research merit. STS has long observed that the epistemic authority of science is achieved in large part by its performance as "disinterested" and "stand[ing] apart from the contaminating touch of politics" (Jasanoff 2005). Somewhat differently, as biomedicine is hailed as an engine of innovation, we note political actors and research sector champions alike emphasising its social value, commercial necessity, and political responsiveness. The engagement by medical science in sociopolitical promising that requires demonstration of its own hybridisation offers an intriguing new site for theorising processes of co-production.

Session Organizers:
Jane Vedel, Copenhagen Business School
Andrew Webster, University of York
John Grant Gardner, Monash University, Australia

Chairs:
Jane Vedel, Copenhagen Business School
Andrew Webster, University of York

Discussant:
Matthew Kearnes, Environmental Humanities Progarmme, School of Humanities and Languages, University of New South Wale

127. The Making of Asian Science: Comparative and Historical Perspectives
Papers for Open Panels/Is there such a thing as Asian science?
Open Panel
11:00 to 12:30 pm
ICC: C2.6
This session explicitly brings together STS scholars who study scientific research systems in various Asian countries, and particularly India and China. These papers consider the development of scientific research in these Asian countries and the role played by governance systems, East-West-East mobility, and locally-grounded cultural and philosophical traditions in the dynamic shaping of scientific practice in Asia. The papers focus on either the contemporary period or earlier eras including the colonial and pre-colonial, and offer a range of methodologies from interviews to archival research for the study of Asian science.

Participants:
"Asian Science", as understood by Western-trained, Asian-born Scientists *Anju Mary Paul, Yale-NUS College*
The production of knowledge is contingent upon the context in which the research is carried out. As science, and particularly bioscience research, becomes increasingly complex and team-based, the systems in which knowledge is produced impinge upon the research work itself, affecting the kinds of research questions that are pursued and the approach taken. This paper explores the idea of an Asian approach to scientific research, recognising the unique role played by Asian developmental states, and cultural and structural differences in the relative priorities given to basic vis-à-vis applied research, reporting and funding structures, the degree of transparency in decision-making, and the recognition of women as scientists. The different subjective understandings of "western science" versus "Asian science" are investigated through analysis of in-depth interviews with Western-trained, Asian-born bioscientists in China, India, Singapore, Taiwan, and the United States. These scientists have experience in both Western and Asian contexts are thus in a unique position to delineate differences in the conduct of scientific research and research cultures in both contexts

Institutionalisation And Professionalisation of Science in Pre-Independence Era: A Case of Indian Science Congress Association *Sneha Sinha, Jawaharlal Nehru University*
The Indian Science Congress Association (ISCA) occupies a unique place among various scientific institutions of the late nineteenth and early twentieth century in India. It has been a pivotal organization in shaping science in India. The paper aims at assessing ISCA's role in the overall progress of science in India from the time of its inception in 1914 until India's independence in 1947. The paper will primarily analyze ISCA's role in institutionalization and professionalization of science. ISCA occupies a center-stage in the establishment of various scientific institutions, societies, academies of science and specialized laboratories, etc. It acted as a platform for growth of numerous sciences and their specialization. It provided scope for collaboration, inter-disciplinary joint discussions, etc. Its members have played a crucial role in advancing scientific knowledge and increasingly became internationally recognized for their contributions. These developments can be seen entwined with the changing socio-political context in India during the period of study. ISCA as a platform saw reflection of growing nationalism and self-dependency, planning, famines in the post-World War period. It enabled the shaping of a viable scientific community and provided a scope for interaction with foreign scientists. Although ISCA sessions saw a fair involvement of British scientists, there were papers co-authored by both Indian and British or European scientists at various sectional meetings. With the experience of the Second World War and India's move towards self-rule, there was a need felt for greater interaction, intercourse with foreign scientists

and ISCA provided a platform for it. Until 1947, it remained the single national platform catering to different specialisms of science as well as showcasing their progress. Today, ISCA is increasingly been criticised among scientific community for lacking in its vigour. This study is an attempt to analyse ISCA's role in shaping science until India's Independence. It gives us an entry-point for a later research into how scientific institutions fail?, which is a critical for STS. There is hardly any study on scientific institutions or associations within STS. Therefore, this paper tries to fill the gap in the academic research in STS. Keywords: Indian Science Congress, Indian Science Congress Association, ISCA, Institutionalisation of science, Professionalisation of science and Shaping of Indian Science.

Origin and Operation of the Chinese Academy of Engineering: An Interaction between Expertise and Politics *Nan Wang, University of Chinese Academy of Sciences*

Despite the fact that national academies of engineering increasingly influence professional life and public perceptions of engineering, there does not yet exist any extended scholarly examination of the establishment and functioning of an engineering academy. As a contribution to remedying this situation, the presentation will describe the decades-long emergence of the Chinese Academy of Engineering (CAE) and its current structure and operations, interpreted as an interaction between expertise and politics. To understand the CAE origins and activity, it helps to recognize the etymological background of "engineering" and "engineer" in China which indicates the Chinese historical and cultural context for engineering. The brief etymological investigation of the Chinese term gong cheng (engineering) and gong cheng shi (engineer) provides a historical background on the matter that in China political perspectives and interests have been deeply implicated in engineering while engineering itself has become increasingly engaged with Chinese politics and government. The defining relationship is not a tension between engineering and business interests (as Layton has argued was the case for American engineering) but one between engineering and politics, as revealed especially in the establishment and functioning of the CAE. With the founding of the PRC in 1949, and then after the interruptions of the Great Leap Forward and the Culture Revolution, national development needs contributed to the advancement of engineering development. In these circumstances, formal establishment of the CAE went through a long process during the period from its original conception in 1978 to its final birth 1994. The conception of creating the CAE initially originated from and was promoted by some CAS members to upgrade the status of engineers and facilitate the development of engineering. This was due to both the urgent need for national modernization and the general growth trend of international engineering institutions. After years of private discussion among the originators, some politicians joined with the scientists and engineers and submitted a CAE creation proposal through an available political channel. Repeated pressures from the public and central government concern resulted in eventual CAE establishment. An examination of the CAE structure and scope of activities during the first twenty years of its existence further confirms this interpretation. An analysis of the CAE's tasks, nine divisions, and

membership illustrates that the structural development of CAE was not only based on the need for expertise for the national modernization, but also the effect of politics on academic promotion. In addition, the examination on CAE's strategic national consultations, scientific and technological services, and engineering personnel training shows that the CAE has increasingly sought to place technical expertise in the service of governmental decision making. In general, the CAE offers a strong example of the Chinese understanding of this politics-engineering interaction. In most countries, the problem of an alliance between applied scientists, engineers, and the state, that is, a technocracy, has been discussed mostly in terms of the ways such a relationship constitutes a challenge or threat to democracy and public participation in political affairs. By contrast, in China the policy recommendations from scientists and engineers can be interpreted as a kind of democratization insofar as it involves more than politicians in political decision making, which is so called China model.

Evolution of Biotechnology in India: Historic and Epistemic Trajectories *Abhinav Tyagi, Indian Institute of Technology Bombay*

By mid of the twentieth century, various parts of the world, especially Europe and America had already picked biotechnology researches as one of the major focus areas. Until 1963, India did not have any formal research and training program in biotechnology. Biotechnology researches and training usually were a part of disciplines like chemical engineering, agricultural sciences, and microbiology. A handful of Indian scientists trained in the 'west', took the initiative to start formal training and research in biotechnology. Within a few years, this new interdisciplinary branch established itself as a new discipline. Analysing historical and ethnographic work on the development of biotechnology in India, this paper would be focusing on the role of individual actors, institutions, government policies, socio-political urgencies in the region, international partnerships and key events like conferences and seminars that have played a role in shaping the trajectory of the discipline in India. From the techno-science perspective, new knowledge generation is a dialectical process between technology and science. The trajectory of the discipline would depend on the historical interplay between technology and science as both of them shape each other. In conjunction, besides exploring the history, this paper would also focus on the technological aspect shaping the discipline. Enquiring into the relation between the epistemic trajectory of the discipline and the (western) location of technology transfer and knowledge dissemination, would aid a constructive reflection on continuities and discontinuities of the discipline from the 'west'.

Session Organizer:
Anju Mary Paul, Yale-NUS College

128. **Contested Academic Norms - Unraveling Evaluation Discourses and Practices in an Age of "Excellence" I: Globalisation and the Making of Academic Excellence**
Papers for Open Panels/Contested Academic Norms: Unraveling Evaluation Discourses and Practices in an Age of "Excellence"
Open Panel
11:00 to 12:30 pm
ICC: E3.10
Participants:

Current Internationalization Policies And Its Impacts On The Practices Of A Global South Scientific Community *Maria Cristina de Oliveira Cardoso, UFRJ - HCTE; Claudia Santos Turco, HCTE-UFRJ / FIOCRUZ; Edmar Machado Braga Filho, Federal University of Rio de Janeiro; Marcos Fialho Carvalho, UFRJ - HCTE; Heloisa Helena Costa, Universidade Federal Fluminense; Denise Cristina Alvares Oliveira, Federal University oh Rio de Janeiro - UFRJ; JULIANA COUTINHO OLIVEIRA, HCTE-UFRJ; Eduardo Nazareth Paiva, EDUARDO NAZARETH PAIVA*

Postgraduate studies and research work are becoming increasingly internationalized activities and so are their norms and evaluation procedures. But what do we mean by internationalized and how does this increasing standardization affect institutions in the Global South? In many countries, these imported values are locally translated into policies, regulations and indicators that influence the evaluation of their postgraduate programs, of the journals in which it is better to publish and the activities that researchers must dedicate themselves. They also determine the flow of funding. The objective of this paper is to understand how these international standards are used in Brazil by the financing agency Capes / Brazilian Federal Agency for Support and Evaluation of Postgraduate Education. For this, the present work will analyze reference documents and databases, comparing its evolution over time and evaluating the different scientific fields. The main issues addressed are related to who defines what is academic excellence? How does this definition is translated into Brazilian policies and regulations? How these policies and regulations work and how they provoke inequalities between institutions and different lines of research.? Can the use of imported / international values hamper indigenous development? This proposal is also facing the challenge of dealing and analyzing the Matthew effect (Merton, 1968) in Mertonian institutions. Our point of view and our situated knowledge (Haraway, 1988) are thought by masters and doctoral students of the Postgraduate Program on History of Sciences and Techniques and Epistemology of the Federal University of Rio de Janeiro, Brazil.

Establishing Excellence in Collective Efforts: The Case of Experimental High-Energy Physics *Helene Sorgner, Alpen-Adria-Universität Klagenfurt | Wien | Graz*

Academic researchers are often evaluated and promoted based on their publication record. Motivated by a "cycle of credit" (Latour & Woolgar, 1979), researchers re-invest the credibility gained by publishing results in order to conduct further research. Yet evaluation based on an individual's publications is obsolete in experimental high-energy physics, where collective authorship has become the norm (Biagioli, 2003; Birnholtz, 2006). In this discipline, the cycle of credit involves the credibility of entire experimental collaborations, some with over 3,000 members. How, then, do individual scientists construct a career within these collective efforts? Communities organised in experimental collaborations such as those located at CERN's Large Hadron Collider (LHC) have developed alternative practices of evaluation and credit cycles particular to this epistemic culture. My paper reconstructs these internal and often informal practices of establishing and attributing individual excellence and credibility, based on interviews with physicists working in the LHC collaborations. The experiences of PhD candidates and early-career researchers serve as an entry point for investigation as these groups are particularly exposed to various "regimes of valuation" (Fochler, Felt, & Müller, 2016). While physically located at their home institution, embedded within a national career system, and contributing to a specific research effort within their multi-national collaboration, junior researchers need to establish their worth on several dimensions. Drawing on STS research on epistemic practices, academic careers, and valuation studies, this paper explores how collectively maintained standards of excellence affect knowledge production and career aspirations in the complex working conditions of an experimental collaboration.

The Construction of Academic Excellence and University Responsibility in Taiwan *Ming-Te Peng, Goldsmiths*

This study aims to elucidate how the discourse of academic excellence has been formalised in Taiwan. Academic excellence has become the main mission of universities in Taiwan, while the content of academic excellence implies publications on high-ranked journals or patents occasionally. When the language of academic excellence is widely used in office presses, mass media and academic journals, it seems like the definition of academic excellence is universal and taken-for-granted. In this study I will prove that there are several changes in ideas of university responsibility and the conception of academic excellence began to link the university responsibility from the 80s. The rise in the emphasis on academic excellence is often considered a part of the globalisation of higher education market. I argue that contextual factors also play a role in the emergence of academic excellence as one of the university responsibility by reviewing historical documents. This research is conducted on the basis of discourse analysis. Materials that I utilised include government's presses (Ministry of Education and Ministry of Science and Technology), and academic series in the discipline of education from the 70s. In summary, along with the globalisation of higher education, domestic issues, like democracy movement, class conflicts and university's autonomy, had been involved in procedures of problematisation of universities. In addition, the successful introduction of new standard for academic excellence is still based on a consensus among various local actors in the sense of ANT instead of just an international movement.

Gendered Representations of Excellence in Evaluation Discourses and Practices in Academia *Andrea Wolffram, RWTH Aachen University*

The evaluation of the scientific performances of researchers is fundamental for their career progression. The presentation is concerned with the concept of research excellence and how it is perceived among German researchers. It focuses on the subjectivity of evaluations of excellence in promotion and hiring processes in academia with regard to Science and Technology (S&T) disciplines. In particular gender-related factors are discussed, that influence the evaluation discourses and practices. Moreover, the contribution analyses how the demands of gender equality are negotiated within evaluation discourses and in relation to the concept of excellence. The work draws on qualitative data from interviews with researchers at a German university. The interviewees cover different levels of a

scientific career. Discourse analysis was applied to reveal evaluation discourses and practices with regard to researchers "excellence". It can be shown that evaluation discourses and practices differ among researchers. Different types of researchers can be identified in terms of reflecting and practicing excellence evaluations. However, regardless of the type most of them perceive gender equality measures in hiring procedures as undermining the meritocratic principle. Furthermore, most of them think that societal conditions outside the scientific system are responsible for the underrepresentation of women in leading positions in academia. The findings contribute to STS by working out mechanisms how the category gender relates to excellence in science. In particular, they show how gender is constructed in evaluation discourses and practices. Criteria for excellence are negotiated in gender biased evaluation discourses which influence evaluation practices.

Dramatic interaction between professors and students within educational technology. *Shui Kau Chiu, The Hong Kong Polytechnic University*

Science and technology have transformed pedagogy and course management systems (CMS) have been widely adopted by universities. The adoption was, however, rarely self-motivated. Both professors and students have no real autonomy in their decisions when using CMS. While professors may have adopted CMS reluctantly simply in response to the universities' policies to secure their job positions, students may be instructed by professors and compelled to use CMS to fulfill course requirements. Even though publicly proclaiming at CMS in carrying with pedagogical purposes, both professors and students may have assigned CMS with their own meanings and personal values. Therefore, this paper probes into this conflicting and dramatic attitude and outlines that such attitude not only affects professors and students in perceiving CMS in different manners but also shapes them on how to use and interact with others in it. Dramaturgy is adopted as a theoretical approach in this paper to understand how interaction takes place within CMS using Erving Goffman's idea. Supported by the data collected from semi-structured interviews, this paper suggests that involved parties, such as teachers and even students, should enjoy more autonomy when adopting educational technology. In addition, instead of regarding adoption of educational technology as an exercise of turning teaching and learning activities from physical platform to virtual one, educationists should take social context where students interact with each other into consideration. Contribution from this study can be a reflection on an important role of interaction in an interplay between science and technology and society.

Majorism: Neoliberalism in Student Culture *Coleen Carrigan, California Polytechnic State University*

Declining public support for U.S. higher education and the steady growth of corporate influence on these institutions shape students' experiences of university. This two-year anthropological study at a public university engaged over 500 undergraduate researchers in questions related to the cultural meanings of exclusionary behaviors on campus. Significant findings related to the influence of capitalism on student culture as manifested in what students call "majorism." Majorism describes the policies, values and behaviors that create unequal access to institutional resources based on major field of study and preferential treatment for science and technology fields and their practitioners. Majorism stems from two belief systems: 1) engineering and scientific empiricism are the only valid forms of knowledge production; and 2) human capital enhancement and future earning potential are the dominant rationale for higher education. Under the reign of these two entwined ideologies, the liberal arts are considered obsolete and science and technology fields revered, encouraged and amply funded by capital. In this paper, we spotlight the economic aspects of majorism to better understand how neoliberal class politics play a role in the promotion of science and technology at the expense of socially applicable fields in U.S. academe. By understanding majorism through the lived experiences of undergraduates, this STS study illuminates how market forces hinder activists' efforts to promote democracy, inclusion and the social good in higher education, with implications for combatting discrimination and occupational segregation along vectors of race and gender.

Session Organizer:
Marie Sautier, University of Lausanne
Chair:
Marie Sautier, University of Lausanne
Discussant:
Grit Laudel, TU Berlin

129. Personhood, Law, and Relationality Amidst the New Biosciences II

Papers for Open Panels/Personhood, law and relationality amidst the new biosciences
Open Panel
11:00 to 12:30 pm
ICC: E3.3

The 21st century is witnessing a profound transformation in law and society because of the implications of the new biosciences and biotechnologies. New technologies are emerging that radically challenge our conceptions of nature and law and that demand new tools in the humanities and social sciences to adequately respond and analyze these practices. This panel starts with the premise that these developments provide novel opportunities to thinking anew about the nature and structure of personhood and relationality. Bioscientific advances in the field of postgenomics, neuroscience, research on the microbiome, and immunology are encouraging thought provoking problems for the foundational cultural and legal principles of personality as well as their attendant notion of personal rights. Complex issues arise in the intersection of law, biology, and society, and the panel aims to explore these problems of what can be called emerging issues in "biolegality"—the coming together of biology and legality—and to revisit the concept of personhood in posthuman and relational ways.

Participants:

Racial Futurity: Biolegality and the Question of Black Life
Nadine Ehlers, University of Sydney

This paper considers how IVF donor insemination technologies can open the possibilities for the denial of black life. It asks: how might the birth of black child to a white mother—by way of donor insemination—be conceived as a "wrongful birth," as it was in the 2014 Illinois Northern District Court case of Gramblett v. Midwest Sperm Bank? How is it that someone's race—in this case the blackness of a newborn—can be viewed and

used as a measure of injury (against a white parent) for which compensation or legal reparation was demanded? And, lastly, what does this case reflect about the perceived value—or lack thereof—of black life in America and the possibilities of and for racial futurity, understood as the guarantee of life's continuation? Gramblett squarely placed the question of the valuation of black life before the law, which was used here to adjudicate the personal rights of the mother against her child. In this assessment of biolegality fundamental questions of the intersections of law, biology, and society are brought into stark relief, highlighting the challenges presented through bioscientific-technological interventions into 'life itself.' The paper contributes to STS conversations around the intersections of biomedicine/biotechnology, sexuality, and social justice.

The Transmissive Womb: Rethinking Race in Gestational Surrogacy through Environmental Epigenetics *Jaya Keaney, University of Sydney*

This paper explores how emerging research on environmental epigenetics can reshape cultural and legal understandings of race in the reproductive technology of gestational surrogacy. As Sonja van Wichelen (2016: 174) critiques, understandings of kinship in gestational surrogacy are structured by a biolegitimacy discourse of 'one's own biological child', which centres the genetic parent/s while devaluing the contribution of the surrogate. Drawing on interviews with gay Australian fathers who conceived children via surrogacy, I argue that dominant surrogacy discourses locate race in genetics, and construct the surrogate as a non-transmissive holding environment to bring the already raced, or race-blind, foetus to term. In an effort to rethink this binary, I bring a cultural studies approach together with the insights of STS, and environmental epigenetics in order to figure a transmissive womb. In an environmental epigenetics framework, gestation is a crucial window for environmental exposures that shape foetal gene expression. Here, a surrogate's geo-political location, class and race shapes her environmental exposures and thus the biology of the foetus she carries. In a biopolitical sense, the surrogate's womb is thus a racialising force. This bears significance for two key areas of thinking in STS: how to best regulate emerging biotechnologies such as surrogacy through articulating new 'biolegitimacies', and how to best theorise race as a kinship and legal object in a postgenomic age.

Narrative Epistemology in Jurisprudence and Elective Affinities in Productions of Responsibility for Persons in Pain *Seamus Barker, University of Sydney*

Scientific theories describe pain as an emergent phenomenon arising from complex systems. However, if legal praxis and jurisprudence deal with causation through methodologies more narrative than scientific, could such an epistemology condition the way that "facts" regarding responsibility for pain are established in Australian society? Specifically, could the processes philosopher Paul Ricoeur describes in relation to narrative - of "ascriptions" of causal-moral responsibility to characters - be central to court rulings on liability for pain, suffering and personal injury? If so, could these ascriptions rely upon, and therefore legitimise, causal models of pain that are scientifically outdated and liable to being strategically deployed to create reductive attributions of personal

culpability or innocence, that serve powerful economic interests? To answer these questions, I will analyse the relationship of narrative to jurisprudence by drawing upon Ricoeur's narrative theory, as well as models of causation in science, narrative, and law. Secondly, I will investigate relationships between economic, political, legal, scientific and medical fields, by analysing the regulatory framework for Workers Compensation in the Australian State of Victoria. Specifically, by drawing upon various Acts which govern Workers' Compensation, Ombudsmen's Reports, interview material with lawyers and legal scholars, and an analysis of selected Case Law relating to personal injury torts. Finally, I will investigate how Australian courts have responded to this regulatory framework and to scientific and medical theories of pain, in making judgments regarding the reality, legitimacy, and cause of pain, particularly in its relationship to the suffering person, their injury, and their subsequent earning capacity.

Unrighteous Ambiguity: Reproductive Technology and navigations of maternal, fetal, infant and paternal personhood *Debbi Long, RMIT University, Melbourne*

Based on ethnographic fieldwork undertaken in an Australian public hospital maternity unit, this paper presents four case studies to illustrate complex and contested articulations of personhood evident in biomedicalised birthing environments. (1) In Australia, legal personhood is granted to a fetus at 20 weeks: if a pregnancy terminates prior to that it is regarded as a miscarriage/abortion, while a pregnancy terminated at 20 weeks gestation is regarded as a stillbirth, requiring a death certificate. It is not uncommon for the termination of a pregnancy on genetic grounds to take place after 20 weeks, requiring the active killing of a 'person'. (2) Down Syndrome is the iconic genetic condition in which discussions of genetic terminations are frequently framed, and one of the most common conditions to trigger a genetic termination. Obstetricians and GPs, whose careers and identities are predicated on their intelligence, are key actors in advising a woman or couple when a test result is received that reads positive to Down Syndrome, for which the most commonly understood 'symptom' is 'low intelligence'. (3) From this study, evidence strongly suggests that paternal reproductive opportunity dominates over maternal health in some considerations of planned hysterectomies. (4) There is evidence to suggest that 'undiagnosed pregnancies', which often lead to copybook 'natural' or 'active' birth outcomes, are subject to unusual levels of postnatal intervention. I suggest that what draws these four examples together are underlying moral epistemologies about righteous personhood which permeate decision making and care delivery in biomedicalised maternity environments.

Bio-Polygraphs, Nonconsensual Data, and the Suspicious Body of the Unaccompanied Minor *Zsuzsanna Dominika Ihar, University of Sydney*

Over the last century, the category of 'child' has been the result of a large margin of error, as well as inexact science; deducible from an erupted third molar, carpal x-rays, and even minute-long visual appraisals. In this paper, I aim to examine the ascent of age-verifying medical technologies within Western border-politics — from the use of bone densitometry, to GeoSentinel Surveillance data — focusing explicitly on the

deconstruction of refugee and migrant bodies into flattened bio-polygraphs. I will argue that these technologies, as well as 'border science' more generally, occupies a moralised legal landscape, where bodies are deemed either truthful or untruthful; capable of superseding any contestation as the child transforms into non-child within the law itself. Case studies from both the British and Australian court systems will be utilised, with particular attention directed towards B (R on the application of) v Mayor and Burgesses of the London Borough of Merton [2003], and The Queen v Astar Udin and Sania Aman [2000]. Indeed, the language of biological hyper-visibility, found within these documents, will be shown to entangle with select scientific terminology, reducing complex human experiences into indistinguishable lists of the physical and microbial. However, the legal rhetoric will also be seen as capable of re-mattering the very categorical markers of child-ness — presenting an opportunity to destabilise a normative imaginary of childhood. It invites a conceptualisation of a non-adult personhood which is less containable, and more prone to shifting physiological parameters.

Session Organizer:
Marc De Leeuw, The University of New South Wales
Chair:
Sonja Van Wichelen, University of Sydney
Discussant:
Jennifer Hamilton, Hampshire College

130. The Medicalization of Aging

Papers for Open Panels/The Medicalization of Aging
Open Panel
11:00 to 12:30 pm
ICC: E3.4

World-wide, the population is aging. Despite this demographic change, aging continues to be viewed as undesirable, with older age associated with loss, decline, and decrepitude. To counter this, medical research has focused on 'correcting' or 'managing' aging, including the signs of aging (such as wrinkles), diseases that have been associated with the biological changes of older age (such as cancer and dementia), or aging as a process in itself (for example, anti-aging research). Such ongoing scrutiny and surveillance of aging and older age reflects medicalization, which embeds medical control and power through knowledge, intervention, surveillance, and medical technologies. The extent to which this occurs, however, may be influenced by a range of social factors including social class, socioeconomic status, ethnicity, geographical location, living arrangements, and so on. In addition, medicalization can be desirable through improvements made to quantity or quality of life, and may be actively sought by consumer and lobbyist groups. In this session, the presenters will explore the different ways in which aging has been medicalized and how this generates and creates knowledges and understandings of aging. Potential topics include anti-aging treatments and technologies, the ways in which medical knowledges and treatments construct older age and reflect ageist values, the benefits and risks of associating diseases with aging and older age (including how this may change social relationships and networks), the impact of the medicalization of aging on professions and professional practices, and how social groups and communities may resist, or lobby for, the medicalization of aging.

Participants:

Putting Age on Ice: Constructing Timelines of Risk in the Development of Gamete Cryopreservation *Ashlyn Jaeger, UC Davis*

In 2012, the American Society for Reproductive Medicine (ASRM) reclassified elective egg freezing as a non-experimental medical procedure, prompting reactions in many adjacent fields. Insurance companies and many corporations reevaluated coverage of gamete cryopreservation, media coverage began debating its pros and cons, and women began utilizing the services at growing rates (Barclay 2015; Robertson 2014). Simultaneously, research on male fertility and aging began to link sperm produced at an older age to an increase in genetic disorders in offspring (Kong et al. 2012; Smith 2014). Answering Almeling's (2015) call for more research on reproductive aging and men's experiences of reproduction, this project offers insights into how biomedical scientists construct reproductive aging as a biological risk to infertility in ways that perpetuate gender stereotypes and difference. Through a content analysis of scientific journal articles published between 1980 and 2016 about oocyte and semen cryopreservation, this study shows how biomedical scientists construct ideal typical timelines for not only biology, but also social relationships and institutional arrangements. Fertility risks are identified when one or more aspects of these timelines falls out of sync with the others. In this case study, age emerges as a tool to police typical gender timelines for work, social relationships, and medical treatment. Cryopreservation is offered as a biomedical tool of fertility risk management, allowing patients to freeze part of their biological timelines. This paper adds to sociocultural theories of risk by exploring the power of chronology in reinforcing gender inequalities through the construction of age-related fertility risk.

Rural Elders: Exploring How Medicalisation Of Ageing Impacts On Conceptions Of Ageing In Rural Australia *Ann Lawless*

Rural communities in Australia are responding to the ageing population in various ways and may be a unique position to mobilise neighbourhood and community resources. However the impacts of medicalisation and formal health systems on ageing in diverse rural communities can pose both enablers and obstacles to the community capacities of a elder-positive community. Rural cultures value some aspects of medicalisation and also manage its disadvantages in strategies which are distinctive from those of urban cultures. For example these can be seen in rural homes and neighbourhoods when we examine a rural sensitised approach to medicalisation, and when we examine the distinctive features and cultures of rurality such as poverty, diversity, medical workforce issues and transport. This presentation explores rural community capability in recognising and "receiving" the Gifts of Elders, those assets and gifts of generous wise older members of resilient rural communities. The challenge is to consider rural ageing and elder-hood as an asset, and also how to empower, enable and support rural Elders.

Resisting and embracing technologies of aged care: Representations and practices of older people *Raelene Wilding, La Trobe University*

New technologies are transforming the expectations and practices of aged care. They are being developed in response to fears that rapid population ageing will produce a failure to meet the needs of aging citizens, but

also in response to the opportunities represented by advancements in fields such as artificial intelligence and sophisticated monitoring capacities. Yet, there has been little reflection on what these new technologies might mean for older people, their care networks (both local and transnational), or their sense of selfhood. In an era of migration and globalisation, to what extent are aged care technologies imagined and presented as supporting global sociality or culturally diverse experiences of aging? In what ways do the transnational flows of designers, marketers and engineers creating local or global solutions to aged care? Drawing both on reports of emergent technologies and also on fictional representations of care technologies in television and film narratives, this paper reflects on the challenges and opportunities that new care technologies are presenting for older people requiring care and their dispersed networks of care providers. Recommendations are offered for designers of new technologies who seek to ensure that their products are not only relevant, but also supportive of the social worlds and selfhood of diverse older people.

How are Cancer Treatment Recommendations and Decisions Reached With/ For Older Adults with Dementia? *Peta S Cook, University of Tasmania; Alexandra McCarthy, School of Nursing, University of Auckland*

In healthcare, health risk assessments are influenced by technical 'objective' measurements of the physical body and disease; the values that underlie professional practices; the organisations healthcare professionals work for; and subjective belief systems of individual healthcare professionals. As a result, cancer treatments prescribed for older adults can be tempered by personal views about a patient's age and other health conditions or comorbidities that they may have. Drawing from interviews undertaken with nine key staff members in a large cancer service, we examine how treatment recommendations and decisions are determined when older adults with cancer also have dementia; two health conditions more common in older age. This exposes that healthcare workers and professionals view dementia in diverse ways, which are influenced by subjective understandings of the older adult's lived experiences of dementia and ageing. These beliefs serve to influence and guide how cancer treatment recommendations and decisions for older people with dementia are reached. This process is further layered with power, whereby the ability to influence such decisions are tempered by one's professional status and their associated understandings of autonomy (individual versus relational). As a result, this exposes the multifaceted influences on treatment decisions and recommendations, including social constructions of health, illness, and age.

Session Organizer:
Peta S Cook, University of Tasmania

131. STS Institutes and Programs: What's Working? What's Not? What's Next?

Papers for Open Panels/STS Institutes and Programs: What's working and what do we want to do next?
Open Panel
11:00 to 12:30 pm
ICC: E3.5

In a fitting memorial to STS scholar Ann Johnson, her parents endowed a new institute in her name at the University of South Carolina. Tasked with building a new institute from scratch, the co-directors and advisory board seeks to survey the field to see what is currently working in STS programs and institutes at other universities. Presenters in this session reflect on their experiences and share their advice. We are hoping for a rich discussion of the pitfalls and promises that will shape the Ann Johnson Institute for Science, Technology & Society.

Participants:

Integrating Engineering Education with the Liberal Arts *David E Drew, Claremont Graduate University; Louis Larry Bucciarelli, MIT*

We have been exploring opportunities to establish an undergraduate, pre-professional, bachelor of arts degree program - Liberal Studies in Engineering - meant to attract students undecided about choice of a major but who have sufficient interest to enroll in a program that keeps open the possibility that they might pursue a career in engineering. For these individuals, the program will offer a smoother pathway into the profession. For others, it will serve as a new liberal arts program centered on STEM. It would take exemplary, substantive content of the "traditional" undergraduate engineering program and infuse this content into courses in the humanities, arts, and social sciences. A workshop,focused on this proposal, funded primarily by the National Science Foundation, and hosted by the National Academy of Engineering, was held in Washington D.C. in January, 2015. This led to a special, double issue of the journal Engineering Studies, about the proposal. A second NSF award is funding a feasibility study meant to gain a better understanding of constraints and opportunities for establishing a program at a variety of institutions. We are visiting universities that have taken some steps to integrate engineering education with the arts and humanities as well as those that are planning to do so. In addition, we will be interviewing both potential corporate employers of the graduates and graduate school admissions professionals. Finally, to explain what we mean by infusing engineering content into courses in the liberal arts, we are developing illustrative "modules" and making them freely available online.

Helping technologists to teach themselves ethics *Greg Adamson, IEEE SSIT*

History shows us examples of both alignment and hostility between technology and the humanities. William Morris, the late 19thC founder of industrial design, was an historian and artist. At the opposite pole, CP Snow in the late 1950s damned the humanities as "effeminate". Today technology development is creating an intersection of interest in ethics. Students of science for the past century and more have considered philosophical questions: the origin of the universe, and the species. Technology students, by contrast, can complete an undergraduate degree without considering a single philosophical question, with the possible exception of the 2nd Law of Thermodynamics ("heat death of the universe") if they are really paying attention. Terminator movies and global warming started to disturb this ethics free zone, but in the 2010s the impending introduction of driverless cars has changed this forever. Suddenly "Who should the car hit?" is a question for all technology students. Moral philosophy has burst in. Serious questions are emerging: ethics and design, the obligations of professionals for intelligent systems they create, the impending end to work as we know it, autonomous

weaponry. In 2017 the Institute of Electrical and Electronics Engineers amended its Code of Ethics to examine several of these issues. IEEE's next challenge is to create educational programs that communicate these to its 430,000 members, and embed them in tertiary curricula. This cannot be effectively achieved without the active engagement of the humanities, and importantly the STS community. How do we go about this?

Trans-Continental Lessons in Problem-Centred STS Institution Building *Joan Leach, Australian National University; Sujatha Raman, The Australian National University*

How do we do problem-centred STS in university environments which remain structured by disciplinary concerns? In this talk, we bring together our collective experiences of STS institution-building via research, training, mentoring and nurturing capacity in different continents to address this question. In the early 1990s, it was possible for scholars (Brante et al 1993) to argue that STS was dominated by studies of 'calm' forms of scientific content and that more attention was needed to ('hot') controversies and to greater engagement between science and society. Twenty-five years later, public engagement and controversies involving science are central concerns in STS, in turn generating new challenges and opportunities for our field. These issues have also become research topics in their own right, including within the institutional homes that we inhabit (CPAS, the Australian Centre for Public Awareness of Science, and ISS, the UK's Institute for Science and Society), and collaborations that we are a part of (Arizona State University, and the Virtual Institute for Responsible Innovation). Inspired by the questions posed by this panel and the wider 4S theme of 'making and doing STS', we subject these modes of institutionalisation to reflexive scrutiny. We explore lessons and future possibilities arising from different STS-inspired ways of organising academic communities in order to address societal problems of innovation, sustainability, global development and communication.

Going Down the Rabbit Hole: Adventures, Reflections and Confessions of a Newcomer to the Science Technology and Society Realm *Jeffry Will, University of North Florida*

For many of us working in the areas of Inequality, Race Relations, Civil Rights and Human Rights, the impact of technology takes on special prominence. Whether examining racial disparities in access to technology, the impact on society in general of technological surveillance, the impact of the ubiquitous nature of social media, or the alarming implications of cyber security overreach and the militarization of the cyber world, we have been keenly aware of the implications of "Science and Technology" on society. For a lot of us, however, connecting with the broader world of STS is a new and exciting world only recently revealed. As the recently appointed Editor in Chief of the Bulletin of Science Technology(BSTS), I dropped into this new realm with eyes wide open, but with little direct experience with the STS background and/or practitioners. In this paper, I discuss the experiences of entering the STS realm, the "background work" required to gain operational understanding of the area, and the learning curve taking me from basic inquiry into the social issues affected by technology to a basic gatekeeper of the STS knowledge base. Implications for the dissemination of STS knowledge through Science, Technology and Society, as well as possible collaboration with BSTS and other STS organizations will be discussed.

Session Organizer:
Allison Marsh
Chair:
Allison Marsh
Discussant:
Allison Marsh

132. Platform Practices and Predictive Seeing 2
Papers for Open Panels/Platform Practices and Predictive Seeing Open Panel
11:00 to 12:30 pm
ICC: E3.6

Large image collections ranging from Sloan Sky Survey, through to ImageNet play a vital role in contemporary economies of knowledge. Yet actual image practices, operations and techniques pertaining to such collections remain relatively occluded. How do data-oriented visual cultures also re-organise 'seeing' in the light of prediction? This panel invites contributions dealing with routine, habitual and everyday data practices that have developed in relation to large image collections in contemporary sciences, industry, media, government and cultural institutions. We welcome research working with or analysing image-sets in their predictive transformations across these domains. Here contributions might address how the formatting and processing of images collections and streams – for border control facial recognition, discrimination of objects in robotic manufacture, earth system observation, smart city urban infrastructure and so on – create the material conditions for predictive models. Everyday data practices concerned with collecting, archiving, ordering or moving through image collections or images streams would be relevant topics. How do STS concepts of knowledge infrastructure, platform, centre of calculation, algorithm or large technical system help us understand changes in the operational role of images in prediction, whether, for example, in earth science or social network media? Re-conceptualisation of ontologies of seeing, image, data, model, prediction and knowledge are important to the aims of the panel. The panel aims to support conversation traversing some of the different disciplinary approaches coming from media and cultural studies, art-design and STS to this topic.

Participants:

Resisting Visualizations. A cross-species and cross-field comparative exploration – Part 2 *Ann Rudinow Saetnan, NTNU; Rocco Bellanova, University of Amsterdam*

What does resisting visualization mean and what does it tell us about the meanings of visualizations? Over the past few years, we have embarked in a cross-species and cross-field exploration of visual practices. We have focused on bird-watching and on digital surveillance, where humans, data and animals become the object of visualization. As a step in our journey, our attention is now on resistances to visualization, be it on the part of the potential object of visualization or (here in part 2) on the part of the might-otherwise-be visualizer. Given humans' tendency to rely on and to produce visual representations, and given the key positions of visualizations in both surveillance and bird-watching, why and how do those active in these fields sometimes resist producing visualizations? From the point of view of those visualized, why and how do those targeted for visualization (sometimes successfully) resist being visualized? Working from a set of examples, we attempt to categorize motivations and techniques of resistance,

and to draw implications of these for theories of surveillance and of digital media.

The Techno-Ontology of Prognosis *Karin Sellberg, University of Queensland*

This paper considers a means of looking towards, and living with the future, ambivalently positioned between past, present and future concerns: the techno-ontology of prognosis. I will investigate a range of prognostic apps, currently used in Australian and other Western medical practice. By inputting age, sex, life style and medical history, doctors are presented with the possibility of calculating the risk of their patients developing a heart condition, or other potentially life-threating diagnoses in the next 5, 10 or 20 years. These apps are increasingly used to regulate patient health advice and treatment, creating a health profile that is based as much on the future, as on present and past physical realities. My paper will consider the type of affective relationship that appears between doctor and patient (mediated through the app), and the sense of self such temporally complex physicality produces. As Catherine Malabou argues in Before Tomorrow (2016) the future-facing technologies of contemporary life are constructing a new multi-temporal ontology. This paper will refer to Malabou's construct of temporality and self alongside Marie-Luise Angerer's (2014) and Rebecca Coleman's (2017) work on temporality, ontology and affect, to articulate the affective economy that makes up the prognostic self.

The View from the GPU: Graphics Processing Units Solve the Unsolvable *Adrian Mackenzie, Lancaster University*

This paper presents an attempt to speak appropriately about the absorption of images into platform operations and infrastructures. How should we explain the multiplicity of transformations of images and the new operational combinations they display? The paper will explore the mixture of mundane combinations and unpredictable transformations that have appeared in some spectacular platform demonstrations (e.g. AlphaGo, Facebook's 'planetary settlement model') from the standpoint of the GPU, or graphics processing units, that have become central to many predictive models working with iamges. It traces the embedding of images in a GPU-based model as a process that transforms collections into a highly condensed indexical field, a field that allows platforms to generate predictive propositions or statements about the world. In describing how predictive indexicality takes shape on platforms and machine learning models, the altered collectivity of images under platform conditions becomes more evident. The aim here is to reverse the viewpoint of most recent accounts of AI, and to unfold the labyrinth of operations that have generated the quasi-transcendence effect that animates many recent accounts and debates about AI/machine learning.

Visualizing transnational threats across the internet *Andrew Clement, University of Toronto*

Digital imaging practices greatly expand the possibilities for what phenomena can be rendered visible, for what purposes and in whose interests. They invite critical reflection on the malleable, contingent, often messy character of images, as well as their uses and abuses, and especially their seductions and perils for prediction and interdiction of threats. Through two linked case studies, this presentation explores these issues in relation to the transnational surveillance platform that the Five Eyes security alliance has embedded within the internet. Both cases involve the generation and interpretation of large datasets of IP addresses, which combined with estimates of physical location and user identities, are enrolled in constructing geographic maps - knowledge production promising to render disparate forms of threat visible, predictable and actionable. The first case analyses one document released by Edward Snowden, "IP Profiling Analytics & Mission Impacts," that reveals one attempt of the Canadian national signals intelligence agency, CSE, to address the 'needle in the haystack problem' – spotting individuals who threaten national security but whose activities are 'hiding' within the enormous data flows captured at obligatory passage points of the global information infrastructure. The second case focuses on the IXmaps.ca internet mapping project, which adopts similar IP analytic techniques reverses the gaze on this secretive spying by developing map images of internet routing. Here the objective is to render more transparent and accountable the likely locations and actors of internet interception, and the threat being exposed is to civil liberties from the security intelligence apparatus itself.

When Images Become Logic *Monica Monin, University of Technology Sydney*

Machine learning presents a substantial change in both the production and operation of computational codes. Unlike the application of pre-determined logic to data that takes place in hand-coded programming, in machine learning masses of data inscribe logic through the training of neural networks. A neural networks reasoning is proving difficult to comprehend as it traverses the behaviors of interconnected layers of 'neurons'. Matteo Pasqinelli describes the training of a neural network as a process whereby a representation of the world in a dataset becomes an operative function. In most circumstances, the generated function is tested or employed upon on similar descriptions of the world. For example, a database of digital images of numbers is used to train a network which is then used to classify other digital images of numbers. A network's 'accurate' prediction or classification is thus reliant upon the consistency of description and the world described. The growing general application of machine learning, in less restricted settings, calls for studies into the practices and material conditions that are drawn together in the formation of its algorithms and their ongoing conduct in the world. This study takes up artistic labour with machine learning as a valuable site to do this. Examples studied display how training with specific data sets creates differences in how neural networks as operational formations in the world 'see' or 'know'. And how in a world where formations such as predictive seeing are active, images 'seen' by networks have differential productive potentialities.

Session Organizers:
Adrian Mackenzie, Lancaster University
Anna Munster, University of New South Wales
Chair:
Anna Munster, University of New South Wales

133. Disrupting, Broadcasting and Commercializing Science
Single Paper Submission
Open Panel
11:00 to 12:30 pm
ICC: E3.8

Participants:

An Archaeology of Mindhunting: Portraits of the Serial Profiler as a Figure of Reflexivity *Frederic Claisse, Université de Liège*

In the year 2017, two television series focused on pivotal moments in criminal psychology. In Mindhunter (Netflix), two pioneering agents from the FBI's Behavioral Science Unit introduce new approaches to an emerging form of crime that defied categorisation, becoming the first "profilers" of "serial killers". In Manhunt: Unabomber (Discovery Channel), another FBI agent develops a groundbreaking method of investigation based on idiolectal discursive patterns as revealed in the Unabomber's Manifesto and correspondence, ultimately leading to the identification and capture of Theodore Kaczynski. Inspired by real people and events, the two series depict the heroic struggle of curious and unprejudiced police agents who face doubt and criticism, before eventually causing radical paradigm shifts. If their account of criminological innovation is unsurprisingly whiggish, the prominent role given to social sciences in both series is less conventional: disciplines such as comparative linguistics, critical theory or sociology of the deviance are not only instrumental in solving the crimes, but described as science in-the-making, showcased for their ability to make a difference in the world. Besides, as both series build upon previous representations of the profiler/serial-killer couple in popular fiction, they function as an archaeology of the genre itself. To what extent does this reflexive character of the shows can be compared to STS description practises? What do the series have to say about the role of language – recognized as a means of influence, used by the serial killers as well as by the investigators who resort to the same manipulative techniques to get information?

Brand Deals And Patrons: Alternate Funding Structures In Science Content On Youtube *Brian Pleasants Harper, Indiana University Bloomington*

Viewers interested in scientific content are increasingly turning to the education and entertainment that may be provided by content creators on YouTube. Amidst the videos produced by external media organizations are channels created by YouTube users who earn all or a significant portion of their income from their YouTube videos. The most popular videos about science are not usually produced by scientists, but by enthusiasts who wish to share both their enthusiasm for and beliefs about science. While traditionally content creators receive income on YouTube based on advertising directly through the platform, increasingly content creators are turning to direct advertising agreements with external corporations and crowdfunding solutions through external websites like Patreon to earn their income. This paper uses a content analysis of high-subscriber count independent science channels on YouTube and critical readings of their advertisements and crowdfunding pitches. By exploring the strategies and dynamics of these two alternate methods of YouTube income, it permits a more complete understanding of the political economy of YouTube and the impacts this economy may have upon the views of science and scientists as expressed by these content creators and communicated to their thousands or millions of viewers.

Disruptive Innovation, Predictive Analytics, and the Soft Determinism of the Fourth Industrial Revolution *Grant Fisher, Korea Advanced Institute of Science and Technology (KAIST); HyeJeong Han, Korea Advanced Institute of Science and Technology (KAIST); Richard Sung, Korea Advanced Institute of Science and Technology (KAIST)*

In this talk, we explore an aspect of the strategic deployment of "disruptive innovation" within the discourse of the so-called "fourth industrial revolution". We offer a theoretical perspective on disruption as an ethos of industrial and commercial science and aim to contribute to STS by engaging with its implications for science and technology governance. One example of the potentially disruptive innovation concerns the impacts of artificial intelligence algorithms and predictive data analytics in judicial contexts. A.I. is increasingly used to perform non-routine cognitive tasks. Proprietary A.I. algorithms are used to make risk assessments in order to assist judges in sentencing convicted felons in some U.S. states. A.I. risk assessments and predictive data analytics (such as predicting the likelihood of recidivism) can operate in ways that disrupt or destabilize as well as to re-stabilize various conceptions of legal procedure amid concerns about bias in judicial decision-making. On various sides of controversies regarding the application of proprietary software in judicial contexts, conceptions of human rights, the practice of ethics, and legitimate distinctions between commercial and non-commercial applications of technology are fluid and contested. Underlying these destabilizations and re-stabilizations is a discourse engaged with the restructuring of science and technology governance. The ethos of disruption expresses a desire for entrepreneurs to deliver continuous innovation and also for the control of innovation though management and governance. We suggest that the ethos of disruption and its counterpart "agile" governance (hence "re-stabilization") constitutes a kind of "soft determinism" and we explain how we conceive its significance within the context of a recent research project conducted at our home institution.

Monies, transactions, and relationship-building among Japanese academic bio-scientists – reconsidering the "economic logic" of commercialization *Nahoko Kameo, New York University Department of Sociology*

This paper depicts the multiple ways through which Japanese academic bio-scientists enacted commercialization practices as both monetary and non-monetary exchanges. While some exchanges can be understood as straightforward monetary transactions, other exchanges acted simultaneously as exchange, relationship building, boundary work between academe and commerce, and the purchase of legitimacy in scientists' professional life. Interviews with scientists reveal thatcommercialization activities, usually thought of as pure economic pursuits and capitalization of university knowledge, have often been understood as normative, relational, and organizational projects for the scientists. By showing the non-economic aspects of university research commercialization the study contributes to our understanding of how more entrepreneurial academia may be moralized, and how we can understand variations in discourses and practices of "the entrepreneurial university" in different national contexts.

Session Organizer:

Nahoko Kameo, New York University Department of

Sociology

Chair:
Nahoko Kameo, New York University Department of Sociology

134. (Re)Thinking Mobilities and Chinese STS:" The Politics, Practices, and Cultural Logics of Diasporic Chinese Scientists in Technosciences, 1919–2018
Papers for Open Panels/(Re)Thinking Mobilities and Chinese STS: The Politics, Practices, and Cultural Logics of Diasporic Chinese Scientists in Technosciences, 1919-2018
Open Panel
11:00 to 12:30 pm
ICC: E3.9

Our panel encompasses papers about diasporic Chinese in the technosciences from 1919-2018. We are particularly interested in interdisciplinary work and projects that emanate from gender, ethnic, and global studies, examining Chinese diasporic women scientists' and engineers' careers, education, and webs of relationships. We also welcome papers that address the representations of Chinese scientists in media, art, and popular culture; and explore their professional identities, experiences, and solidarities. Focusing on the period 1919-2018 is a challenge to rethink the mobilities of Chinese technoscientists across a spectrum of historical, political, and cultural pasts and presents without assuming conventional periodizations. We seek papers that undertake topics historically, as well as in contemporary times; and call for projects that use a variety of methodological and theoretical approaches to queries like these: • How are notions of modernity, scientific progress, and intellectualism reimaged through diasporic Chinese technoscientists, their international careers, and TRANSnational Chinese STS? • How do dispersed communities of Chinese technoscientists disrupt current debates about cosmopolitism, internationalism, nationalism, globalizations, diasporas, transnational migration, and indigeneity? • How do Chinese scientists disrupt the ways we understand the unequal, varied, and complex practices of technosciences globally? • What are the innovative theoretical and methodological ways to investigate Chinese scientists' continuing, strategic renegotiation of class, ethnic, gender, and minority status as they circulate translocally amid globalization? • How have diasporic Chinese scientists' interventions differed across the technosciences and STS genealogies?

Participants:

A Diasporic Travelogue of the Chinese Anti-Malaria Materia Medica' Yao' : 'Changshan' *Rey Calingo Tiquia, University of Melbourne*
Back in the l940's in China, 'Changshan' (whose root is used as a 'yao' to treat malaria) figured in a controversy between TCM and biomedical practitioners. This resulted in the 'Changshan's'traditional 'Qi 'properties being hegemonically translated as an 'unidentified isolated alkaloid' and reworked into the biomedical socio-technical network. The values of Western science became the sole criterion upon which TCM was to be judged. To be accepted as 'scientific' the elements of TCM practice had to be de-localized and placed in 'universal' theoretical frames.In a critique this hegemonic mode of translation which governed the interaction between the two medical knowledge systems, Dr. Sean Hsiang Lin Lei pictured this dominant translation network in this way:
In short, in the Reversed-Ordered Program, Chinese drugs would more or less circulate in their traditional socio-technical network until Western-style doctors succeeded

in materially reducing them into the constituents of their network. In this case, Chinese doctors had a good chance to travel with the Chinese drugs into places where they had not previously had access (like in hospitals). On the contrary, if the Received Program did work, the fully scientised drugs would be taken away from the hands of Chinese doctors. Drugs would be synthesised chemically, named by their chemical composition, designated to treat "Western" diseases, and circulated in the network of Western-style hospitals, laboratories and pharmacies. Chinese doctors had nothing to do and nowhere to go except to watch the inevitable demise of Chinese medicine.

Chinese Diaspora and Trans-national Science: Chao Yuen Ren and Cybernetics in Cold-War America *Chen-Pang Yeang, University of Toronto*
While Chinese went abroad to study science as early as the first decade of the 20th century, the number of Chinese scientists immigrating to Western countries did not become significant until after World War II. Zuoyue Wang has noted that the large influx of Chinese scientists to the postwar United States led to a sea change both of the American academia and industry's cultural and ethnic landscapes and of the international networking of the Chinese scientific communities across the Taiwan Strait. Yet, historians and STS scholars have rarely examined how the surge of diasporic Chinese scientists in the West influenced the approaches, content, and practices of scientific research during the Cold War. In this paper, I grapple with these issues via a case study of the Chinese-American linguist Chao Yuen Ren's work on cybernetics in the 1950s-70s. A leading Chinese intellectual in the 1920s-30s and a prominent American researcher in the 1940s-70s, Chao began to show interest in feedback control in the 1940s and interact with the American cybernetic community. In the following decades, he employed the concepts from information sciences to examine and understand phenomena in Chinese phonetics, opening up a connection between linguistics and information sciences. I argue that Chao's route to cybernetics was heavily shaped by his own experience as a language researcher and reformer in China in the 1920s-30s. His work thus constitutes a perfect example of trans-national science in which the diasporic scientist transmitted, mediated and integrated knowledge, expertise, and experience from distinct national contexts.

Chinese Dreams? American Dreams? Gendered Transnational Networks, Guanxi, and the Power of Reversed Migration *Diane Gu, UCLA*
Foreign-born women scientists and engineers who are studying and working in the United States constitute a rapidly growing yet understudied group. Despite being highly educated and well represented in U.S. science and engineering fields, they remain invisible. Chinese women make up a significant part of this group. In the physical sciences and engineering, many of these women have pursued their undergraduate education in their home countries but have their doctoral work in the U.S. and then remaining to pursue careers. However, publicly available large-scale data on international students and scholars is extremely scarce; and what there is rarely indicates the gender breakdown within such groups. This is one reason that systematic and longitudinal studies of science and engineering international women students'

mentoring relationships, gender dynamics, social networks, challenges and career outcomes are yet to be seen. Derived from my recent book on Chinese women scientists in the U.S., this paper explores the transnational connections that Chinese women build over the past two decades and their impact not only this group of immigrant scientists in the U.S. but also transnational scientific research and collaborations. It is important to explore the motivation, immigration patterns, career paths of women Chinese graduate students in physical sciences and engineering programs. In particular, it is crucial to understand the part of Chinese culture and history that heavily impacts the education system and schema in China, and how these in turn affect the lives of Chinese women who study and work in the U.S.

The Revolt of Chinese "Red Engineers" ——from the Department of Technological Sciences of Chinese Academy of Sciences, to the Independent Chinese Academy of Engineering *Zhihui Zhang, Chinese Academy of Science*
In the past, scholars have paid more attention to the history of engineers themselves as well as their social appeals. However, there is a lack of in-depth discussion on the question of evolved relationship between engineers and scientists in social development after post-war II. In socialist China moving towards the ambitious industrialization, engineers with lower academic recognition and social status, not only competed but also cooperated with scientist on defense research projects during 1950-1970. In post-Reform PRC after 1978, the central government called for the integration of science and economy, carried out the scientific and technological system reform. Meanwhile the cadre team reform seeking for younger and more intellectual engineers to be political leaders. As one result, the Department of Technological Sciences of Chinese Academy of Sciences (CAS), gradually departed from the CAS, and established Chinese Academy of engineering (CAE) as an independent honorable institution in 1994. This article will take use of interdisciplinary research methods, combine literature research, oral interviews with original archives, look into the original archives of the CAS and archives of the CAE, in order to recover the historical process. This research will broden the STS research by deepening public understanding towards the history of engineering and engineers.

Transnational Mobilities of Expertise: Case Studies of Chinese Biomedical Scientists *Larry Au, Columbia University*
China's economic rise as has led to heavy state-led investments in the biomedical sector, as well as programs to attract diasporic Chinese researchers to return and contribute to the nation's development. The paper focuses on two groups of Chinese scientists with differently mobile forms of expertise: researchers in traditional Chinese medicine (TCM) and genomic and precision medicine (PM). Using these contrasting cases, the paper reframes the study of high-skilled migrants through the lens of the sociology of expertise or the "networks that link together objects, actors, techniques, devices, and institutional and spatial arrangements" (Eyal 2013, p. 864). Instead of just identifying the conditions that contribute to the mobility of experts, the paper looks at strategies that scientists deploy to create the networks of relationships that enable them to effectively deploy their expertise in new contexts. The paper focuses on the ways

that these scientists construct boundaries that restrict the mobility of their knowledge, and the strategies deployed to traverse and rework these boundaries. By deploying this understanding of expertise, migration scholars can better understand the successes and failures of state plans to attract "human capital" and "knowledge workers". The paper draws on in-depth interviews with over 50 researchers in Mainland China, Hong Kong, and Taiwan, and a content analysis of relevant newspaper publications and documents.

Session Organizer:
  Diane Gu, UCLA
Chairs:
  Diane Gu, UCLA
  Vivian Wong, University of California, Los Angeles
Discussant:
  Roli Varma

135. How Do Governance Mechanisms for Science and Technology Travel Across Borders? 2
Papers for Open Panels/How do governance mechanisms for science and technology travel across borders?
Open Panel
11:00 to 12:30 pm
ICC: E5.1

A major theme in transnational STS is technology transfer; highlighting that one cannot take a technology from one place to another and expect it to function in the same way. Technologies may fail, attain different functions, or be altered entirely. Not only do technologies travel, but so do the mechanisms for governing science and technology. Models of innovation, frameworks of risk assessment, blueprints for public participation, and metrics for technological performance all travel from country to country. In this panel, we explore what happens when governance mechanisms for science and technology travel across the globe. Literature from policy studies often departs from linear models of policy transfer and predominantly focuses on international organizations like the European Union and OECD. We aim to take a more symmetrical view, building upon recent literature on travelling imaginaries (Pfotenhauer and Jasanoff, 2017) and risk colonization (Beumer, 2017), to understand what exactly happens when governance mechanisms for science and technology travel from one place to another. We invite papers that help to feed critical discussions about the way science and technology governance travels, answering questions such as: how do actors draw upon practices from other places and adapt them to local conditions; what actor constellations are involved in making governance mechanism travel in different countries; what happens to governance mechanisms once they are appropriated in different contexts; how do travelling governance mechanisms abate or exacerbate inequality; and what kind of international governance mechanisms for science and technology are being developed?

Participants:
  Of Bits and Pretzels and Bureaucracies: Regional Innovation Cultures and "Conservative Innovation" in Bavaria *Sebastian Michael Pfotenhauer, Technical University Munich; Alexander Wentland, Technical University of Munich; Luise M Ruge, TU München*
  Innovation has become a global economic imperative, with many regions trying to establish themselves as innovation hubs according to international "best practices." Yet, many of these regions are struggling how to reconcile the innovation imperative and its traveling organizational models with local socio-economic

traditions, unique political cultures, and regional identity. In this paper, we explore how regions navigate this tension and resist the adoption of traveling models through unique innovation cultures. Using the German state of Bavaria as an in-depth case study, and drawing on previous work that explores the global circulation of innovation models, I show how Bavaria enacts a particular imaginary of "conservative innovation" in keeping with existing sources of identity and social cohesion. This imaginary is characterized by a tendency to preserve traditional socio-economic orders rather than disrupt them; to favor and safeguard political and economic incumbents rather than enable new entrants; to act from a perceived position of strength or even saturation rather than decline or emergency; and to rearticulate globalized models in local terms. Viewed through this lens of regional cultures, innovation in Bavaria ceases to be a source of disruption and social change and rather becomes a mechanism of socio-cultural reproduction that extends existing identities and frames of reference into the future. This explicit construction of innovation as a source of continuity allows Bavaria to straddle a range of persistent tensions, including traditionalism vs. technological optimism ("with laptop and lederhosen"), cosmopolitan vs. rural lifestyle, and agricultural vs. high-tech state. The imaginary of conservative innovation draws its strength from, and reinforces, a relatively stable political and economic landscape that has enacted regional development through a corporatist "small-state" model since WWII. Our research provides research provides new support for a social-constructivist foundation of innovation theory, highlighting the unique local situatedness and inter-regional differences in the rationalization and practice of innovation policy. It provides a counterpoint to the persistent universalist tendencies in innovation theory around models, systems, and "best practices."

Targeting Inequality through Science and Innovation Policy: Undone Science versus Inclusive Innovation *Thomas S Woodson, Stony Brook University; Logan Dawn April Williams, Logan Williams Cons. Svcs.*

Over the past two decades, the theories of undone science and inclusive innovation were created to explain knowledge generation and research and development (R&D) for marginalized communities. The undone science framework stems from the sociology of science and describes the systematic neglect of scientific issues that impact marginalized groups. The inclusive innovation framework was created by development and innovation scholars to emphasize the need to produce innovations that directly benefit marginalized groups. Despite their similar goals, the undone science and inclusive innovation communities have not interacted with each other, and as a result, the insights from each framework fail to help other disciplines improve opportunities for marginalized groups. This paper compares the two theories by examining the prominent literature in each field. We find that inclusive innovation helps categorize the level of inclusion of technologies and give guidelines to make the downstream science and technology policies more inclusive. Undone science, on the other hand, offers a suite of concepts that shape upstream R&D agendas. The concepts also occupy different geo-political spaces. Inclusive innovation focuses on marginalized groups in

low income countries while undone science is primarily focused on marginalized groups in wealthy nations. We hope our research brings together these frameworks so that society can conduct science, and create innovation that help more marginalized communities.

Travelling Risk. The Governance of Nanotechnology Risk in India and South Africa *Koen Beumer*

This paper investigates how governance mechanisms for science and technology travel by looking at the case of risk governance of nanotechnology in India and South Africa. Risks to human health and the environment are widely seen as a valid object of concern and many governance mechanisms have been developed to address risks. However, not everywhere around the world does risk occupy a central spot on the public agenda. For instance in India and South Africa, key governance mechanisms for risk are either absent or rather young, and technologies like asbestos and nuclear materials have not always been captured and governed in terms of risk. In the case of nanotechnology, however, the potential risks of the technology are currently identified as an important issue for governance by governments in both India and South Africa. This raises the question how risk governance mechanisms emerge in India and South Africa – how risk governance mechanisms 'travel' from one place to another. I will answer this question by drawing upon extensive fieldwork in India and South Africa. In India and South Africa risk governance mechanisms emerged only several years after nanotechnology concerns were articulated in terms of risk in other countries around the world, most notable in Europe and North America, thus allowing a clearer view on the way such discourses travel. I will argue that the way risk is understood and dealt with changes as risk discourses travel around the world, giving many different faces to the world risk society.

When biobanks go global: ethical challenges and governance responses *Lisa Dive, Sydney Health Ethics; Edwina Light, Sydney Health Ethics, University of Sydney; Miriam Wiersma, Sydney Health Ethics; Ian Kerridge, Sydney Health Ethics; Wendy Lipworth, Sydney Health Ethics, University of Sydney*

Biobanks are increasingly linking together in order to maximise their capacity to identify causes of and treatments for disease, and there is great optimism about the potential of these biobank networks to contribute to personalised and data-driven medicine. However, there are also ethical concerns about, among other things, risks to personal privacy and exploitation of vulnerable populations. These concerns are magnified and increase in complexity as biobanks network across international borders. Accordingly, there is a growing recognition of the need for biobanks to adopt governance mechanisms that are cognisant of the challenges of globalisation. In this presentation, we will present findings from our National Health & Medical Research Council (NHMRC)-funded project "Biobank Networks, Medical Research and the Challenge of Globalisation". This is a multidisciplinary and mixed methods project that aims to inform the development of ethically rigorous and culturally informed approaches to the challenges that arise when biobanks form global networks. We will focus in this presentation on Australian biobankers' views about the governance challenges of networking across

international borders, and how Australian biobanks respond and adapt governance mechanisms in order to participate in global biobanking networks. We will also consider how theories of globalisation can help researchers, institutions and regulators to conceptualise the governance of biobanks across international borders.

Session Organizers:
Koen Beumer
Noela Invernizzi, Universidade Federal do Parana
Chair:
Noela Invernizzi, Universidade Federal do Parana

136. Sensing Beyond Borders
Papers for Open Panels/Sensing beyond borders
Open Panel
11:00 to 12:30 pm
ICC: E5.10
What happens to the sensorial when it intersects with the spatio-temporal circulations, exchanges, and politics of late industrial governance (Fortun 2012, 2014)? In conversation with feminists M. Jacqui Alexander and Chandra Talpade Mohanty (2010), this panel explores how the entwining of space, time, and sensing contributes to, upholds, and/or undermines the seductive corporeal illusion of a clearly bounded nation-state, while calling attention to the ways that spaces and bodies operate in systems of global power (Agard-Jones 2013). Motivated by a transnational feminist praxis committed to mapping the geopolitical, (neo)colonial and imperial genealogies of power that undergird knowledge production around health, belonging, and citizenship, we think with (and think to push), how sensing is imbricated in or resists the uneven asymmetries of power and privilege. Through examination of waves in earth and water, investigation of the ways that vaccination evokes suspicion while medical education relies on sensed learning, as well as exploration of the ways that microbes and chemicals are sensed at nodes of border crossing, we trace how affective intensities, bodily senses and moral sensibilities are palimpsestic, contagious, fluid, and circulatory; how they move, not only across and between borders over time, but with multiple effects that are oftentimes bound up in and responsive to the sedimentation of conquest and colonialism.

Participants:
Becoming "Too Sensitive" to Vibration: Earthquakes, Mining, and Sensory Knowledges *Shoshana Deutsh, Cornell University*
In Waihi, New Zealand, the ground shakes three times a day, as vibration from OceanaGold's mining operations reverberates to the surface. Home to one of the only underground gold mines beneath a residential community in the world, in Waihi "felt" vibration marks the impact of mining on everyday life. Sensory knowledges have thus emerged as a site of contestation over mining, where residents' experiences are negotiated, legitimated, and often undermined as they become "too sensitive" to vibration. For these residents, vibration is a source of constant anxiety, haunted by earthquakes, and inhabits the possibility that any ground movement could be a potentially disastrous earthquake, a constant threat in New Zealand. This paper uses preliminary ethnographic research conducted in 2016 to explore how OceanaGold co-opts residents' sensory experiences to produce distinct yet constitutive knowledge-making practices that place sensing earthquakes and mining on the same continuum. While residents describe themselves as "shell shocked," OceanaGold seeks to render vibration as normal,

positioning residents as "too sensitive" and yet also unable to distinguish sensations, poor sensors in a world rife with vibration. To be sensitive to vibration therefore demands that residents retool their experiences, even as their experiences become embodied as anxieties. Taking sensing as not a neutral and static vehicle of knowledge production, but instead fundamentally caught up in the exercise of power, this paper argues that following these knowledge-making practices offers a means to denaturalize and undermine the particular sensory ways of knowing underground mining that seek to render disruptive vibration quotidian.

Reading a Wave Buoy *Stefan Helmreich, Massachusetts Institute of Technology (MIT)*
The ocean's properties and processes are these days mostly known though distributed networks of sensors. Among the most widespread are wave-measuring buoys. Such buoys are deployed by national meteorological organizations, state militaries, multinational corporations, and everyday citizens, creating a weave of delegated sensing terrains, diffracting jurisdictions, and layered captures of ocean dynamics. This paper examines the Directional Wave Rider, the world's most widely used buoy, manufactured since 1961 in the Netherlands. I am interested in this buoy's material qualities and networks of use, its life within legal frameworks, and its media ecology. Material qualities: in the digital age, the Wave Rider retains something of a steampunk cast, depending upon interior ratios of glycerin and distilled water, which now couple with accelerometers keyed to Internet relays. Legal frameworks: the Wave Rider — which can be read as a mechanical remainder or trace of the Dutch empire, as part of Cold War infrastructure, and as a cybernetic sentinel for sea level rise — may only be deployed in line with maritime laws and may transmit data only in particular portions of the electromagnetic spectrum. Media ecologies: Wave Riders float nowadays in a sea of many competing sensors, generating representations that circulate into multiple communities of practice. Wave Riders structure what will count as "waves" and produce depictions not only for humans but also for computers and for weather predicting algorithms. Maritime flows and the borders to which they are attached come to be apprehended as combinations of the actual, digital, virtual, and political.

Palimpsestic Refusals: Vaccination and Felt Protection in Barbados *Nicole Charles, University of Toronto*
This paper explores how Barbadian parents use the language of pain and force to respond to the Barbadian Ministry of Health's intensive promotion of the human papillomavirus (HPV) vaccine. Barbadian parents' suspicion toward the HPV vaccine, I argue, ought to be understood as informed by the postcolonial state's contemporary immersion in increasingly technological global (bio)political assemblages, and too, by a shifting and cumulative historical set of practices of violence, surveillance, policing and control of black women's sexuality, their health and reproduction in the name of capital accumulation – practices which Afro-Barbadian mothers sense, and respond to via suspicion. Taking up women of colour and transnational feminist theories of enfleshment, embodied knowledge and futurity, I argue for parents' experience of suspicion as sensed in and through the body, the gut and the flesh, which in turn

constitute a knowledge of protection and refusal that might not only be thought of as form of resistance, but an embodied palimpsestic response to histories of colonial and postcolonial violence. This work engages STS debates on scientific knowledge-making and citizen-society knowledges of health, while further exploring how affects of sensibility and suspicion attach themselves to sites of science, biomedicine, and new biotechnologies. In so doing, it expands boundaries of what we consider both sensible and ethical societal responses to public health in the context of transnational bioeconomies, and racialized and (post)colonial biopolitics

Sticky objects: towards an imploded global history of sensory education in medicine *Anna Harris, Maastricht University; John Nott, Maastricht University*

Doctors need to learn how to make clinical sense, and they do so in a material world (Latour 2004). Learning sensing in medicine is locally specific and tied up in global partial connections, where sensorality may, or may not, cross borders. This paper draws from a comparative ethnographic and historical project that examines how doctors learn sensory skills of diagnosis. Four researchers are conducting ethnographic and oral history research within and across fieldsites in Hungary, Ghana and the Netherlands. The challenge: how, individually and together, to not only follow sensory traces of learning at and beyond each site but also work with acts of comparison across time and place. Inspired by Dumit/Haraway's pedagogical strategy for teaching "fuller world histories" through implosion, this paper will enter this question through the imploded histories of three objects from the fieldsites: a knitted uterus, a leather gynaecology mannequin and a hand-painted poster. Each of these objects are involved in teaching medical students about examining the female reproductive system, including how to know bodies through drawing, seeing, touch and movement. The paper teases out the objects' imploded histories to unsettle some "sticky economic, technical, political, organic, historical, mythic, and textual threads that make up [their] tissues" (Haraway 1997 in Dumit 2014). In doing so it aims to instigate a comparative confrontation that raises important questions about the global politics and materiality of learning sensing in medicine, as well as reflexivity about the difficult process of conducting comparison (Deville, Guggenheim and Hrdličková 2016) in sensory STS.

Tainted Flesh, Tangled Waters *Christy Spackman, Harvey Mudd College*

Taint. In the world of seafood, this little word marks slippery borders, indexing the edible and adulterated, environments polluted and clean, and beyond. The result of chemical absorption into fish from the surrounding watery environment, taint tangles eaters in complex spatial, temporal, and biopolitical relationships that link together sensing human bodies with the nonhuman populations swimming in anthropogenically polluted transnational waters. Drawing on scholarship attending to the uneven porosity of bodies (Agard-Jones 2013) entangled in chemosocial relationships (Shapiro and Kirksey 2017), this paper examines the development and implementation of sensory "sniff" tests to look for taint in the wake of oil spills in the early 2000s through the aftermath of the Deepwater Horizon spill. Through looking at guidelines developed first by the National

Oceanic and Atmospheric Administration/National Marine Fisheries, and Canadian Food Inspection Agency, and later refinements, I ask how these sensory techniques, methodologically rooted in nineteenth-century European psychophysical techniques and culturally rooted in Western conceptions of aesthetic quality have come to unevenly travel through transnational circuits. As taint circulates, it makes perceptible the leaky biogeographical surrounds bounding seafood. In the process, its affective social lives upend straightforward assumptions of inside and out, revealing the uneven ways in which economic power shapes international spaces.

Sensing Food Safety at the Border *Heather Paxson, Massachusetts Institute of Technology (MIT)*

Growing interest in specialty foods is generating a post-industrial, artisanal foodscape in which many food safety standards, presuming and promoting industrial methods and equipment, are becoming outmoded. This paper looks at recent regulatory actions taken by government officials at US ports of entry, such as issuing import refusals to European cheeses on the basis of visual inspections and bureaucratic evaluations that suggest product contamination (by "filth" or opportunistic infection) or adulteration (by an unapproved ingredient). Where regulators perceive risk to domestic agricultural industries or the health of an eating public, artisan producers and specialty importers may sense threat to customary practices of foodmaking and commerce. What can we learn with and about the sensory politics of edibility and food safety by tracking potential impedances in the global circulation of foods as they (attempt to) across international borders?

Session Organizer:
Nicole Charles, University of Toronto
Chair:
Christy Spackman, Harvey Mudd College

137. 'Doing Time': Temporal Imaginaries, Performances, Practices, Infrastructures
Closed Panels
Traditional (Closed) Panel
11:00 to 12:30 pm
ICC: E5.2

STS treatments of the temporal in knowledge production are scattered yet non-negligible (Traweek 1988; Pickering 1995; Bruyninckx 2017; Felt 2017; Vostal et al. 2018). Drawing on the emergent insights from studies of scientific and academic times, the panel's contributions aim to advance this scholarship by addressing how time horizons in research are imagined (i.e. how futures and pasts are construed and (re)invented), how time is performed (that is, how time is accounted for, under which circumstances and imperatives, e.g. time-sheets) and practiced (i.e. how various research-related activities assume unforeseeable duration) in different research contexts. The panel will also explore temporal infrastructures inherent to various institutional configurations in which research conduct takes place. The main objective of the panel is to examine how intersections of different temporal variables and dimension co-shape research processes and outputs as well as lives in science. Specific attention will be paid to scientific 'trans-temporalities', that is sites of research where different (indigenous, 'the other', non-western, western, northern, European) temporal habits and ideologies interact in research practices. This might include scientific groups/labs where temporalities and rhythms of different technologies, cultures and

individual temporal approaches intersect; indigenous and 'other' subjects with their own distinct temporalities and how they are 'made' to interact and often comply with dominant western temporalities (or not); modes and technologies of synchronisation of diverse and often clashing temporalities in research contexts.

Participants:

Trading with beamtime: Temporal economy in experimental physics *Filip Vostal, Institute of Philosophy of the Czech Academy of Sciences*

In experimental physics, time – specifically experimental time, or 'machine time' – acquires amended and qualitatively different significance that go beyond the subjective temporal experience of being busy or running out of time. In various subfields of experimental physics – especially where experiments are conducted through the usage of beamlines – a crucial operational unit is that of beamtime. This study, drawing on ethnographic research conducted in large-scale experimental physics facility, argues that beamtime is fundamental resource that translates into epistemic capital (cf Fochler 2016). Even if beamtime cannot usually be directly purchased and/or exchanged as monetary instrument (apart from commercial users conducting proprietary research), its (un)availability structures research conduct, results and opportunities. Subsequently, experimental physicists craft unique strategies how to secure, maintain and gain beamtime. Following pioneering anthropological work in experimental physics (most notably Traweek 1988 and Law 1994), this study addresses temporal economy and temporal strategies that accompany competition, possession and the use of beamtime as well as the very epistemic implications resulting therefrom. The analysis pays attention to a significant transformation in experimental physics from a relatively small single-purpose particle physics labs to large-scale multi-purpose infrastructural centres, also referred to as 'big science facilities' (Hallonsten 2016). This shift and technologies of beamtime allocation re-open the question of the scope and manifestations of epistemic capitalism in contemporary experimental physics.

Academic waiting games: A paradox in an accelerated academy? *Ulrike Felt, University of Vienna, Department of Science and Technology Studies*

Over the past years the temporal (infra)structures that sustain academic institutions and shape the lives and work of researchers in them have gradually become a matter of concern. In particular issues of speed, pressure and rising competition together with the growing importance of quantitative indicators to measure scientific output and its quality have been critically discussed as producing adverse effects on the work and lives of researchers. This contribution specifically will shed light on the role of waiting in academia. This might seem paradoxical at a time when we diagnose a continuous performance of a lack of time. However, I will argue that it is exactly the contemporary temporalization of academia that brings also a revival of "waiting games". "Making people wait ..., delaying without destroying hope is part of the domination", Bourdieu reminds us. Thus, studying waiting games will allow us to look into a part of the complex topography of power in academia. Waiting for a window of opportunity, for the next open position, for the reviews of papers and projects to come back, ... and many more have become key elements in academic lives.

Waiting games create new types of uncertainties that in particular young scholars have to navigate and cope with. To investigate waiting as a central part of academic temporalities is thus essential to understand both, the ways power is distributed and exercised but also how young scholars are, over quite long stretches of time, "held" committed to academic waiting games.

The experimental rhythms of academic work *Fabian Cannizzo, RMIT University*

Austere funding climates and managerialism within universities has encouraged attempts to rationalise education and research in universities. However, unlike the bodily movements of pig iron workers, famously captured in F.W. Taylor's time-motion studies, most academic work is organised around craft principles that prevent its precise measurement and application of rational time management. The devolution of responsibility for efficiency of academic labour to department managers, teachers, and researchers has nevertheless incentivised experiments and attempts to take control of the rhythms of craftwork by academics. This paper explores (1) the policy decisions that encourage academic workers to seek control of the rhythms of their labour and (2) the strategies that academics have developed to control those rhythms. While past research often points towards the political rationality of academic governance (neoliberalism, managerialism, New Public Management, marketisation) as driving the internalisation of a new work ethos (sometimes described as an enterprising self), this top-down focus is insufficient for understanding the organisation of time in academia. I argue that academic labour researchers should be seeking to understand academics' role in determining their work routines. The experience and organisation of time in academia is not a top-down directive, but rather a dialectic of organisational change management and experiments with self-regulation that ordinarily emerge in social life.

The performativity of permanent and temporal practice: The role of technology infusion *Natalie Hardwicke, University of Sydney*

Organisational work 'practices' are said to constitute how employees exist and belong within their organisation (Tsoukas 2010). Although the sayings-and-doings of practitioners helps to reinforce their practice, the activities of practitioners unfold in and across space-time contexts. This means that the 'constant' of practice is both reinforced, but also open to change, precisely because of the performative temporalities of enacting one's practice. As this enactment will always constitute in-use technology, the different contexts for practical enactment can showcase how new technology can come to 'matter' to practitioners and subsequently their practice (Orlikowski 2010). In turn, a technological change of practice is possible via a process that transitions from observation to usage, which is when technology seeps into the background of practitioner awareness (Riemer and Johnston 2012). By providing reflections as an embedded ethnographer, someone who is situated between business and academia, the aim of this discussion is twofold. Firstly, to demonstrate how practitioners enact their practice in and across temporal settings; and secondly, to showcase how the performativity of practitioners within these temporal contexts reveals the role and potentialities

of technology. Understanding the use and mattering of technology from a practice perspective can demonstrate how one's 'being' in the world constitutes an infused relationship with other practices and technology, both material and digitally based. This view of practice is only slowly gaining momentum in empirical research, even though science itself is another practice that is performed via patterns of technology-infused temporality.

Session Organizer:

Filip Vostal, Institute of Philosophy of the Czech Academy of Sciences

Chair:

Ulrike Felt, University of Vienna, Department of Science and Technology Studies

138. Time of Predictions

Papers for Open Panels/Time of Predictions: Temporality Within Climate and Weather Sciences
Open Panel
11:00 to 12:30 pm
ICC: E5.3

Following calls from scholars in the social sciences and humanities to critically understand anticipatory governance and the constitution of 'the Anthropocene,' this panel seeks to explore how various processes of time formation (e.g. rhythms, durations) are experienced, invoked or ignored in what defines time within different atmospheric and environmental sciences. While the temporal categories that are the past, present and futures are used and reproduced through a rich variety of applications, ranging from daily forecasts, radar maps, natural hazard risk maps to climate services and decadal forecasts, what constitutes time in the fabric of global circulation models (GCMs), numerical weather predictions (NWPs), and other predictive technologies remains largely free from critique. Underlying univocal understandings of time and temporality, one finds a temporal diversity that hinders the ends of anticipation, acceleration, and pre-emptive action in an age of incipient crises. This panel seeks to bring together an interdisciplinary conversation on the topic of 'temporal dissonances,' combining histories of climate and weather prediction with applied research of the social lives of prediction today in order to track differential understandings and experiences of time across different contexts. Possible topics may include: the construction of time in weather and climate modelling; temporality within historical or contemporary climate epistemologies; and/or, experienced time in natural hazard or disaster management and climate forecasting.

Participants:

Risk as problem: The impossibility of prediction *Nicholas B. de Weydenthal, The University Of Melbourne, Australia*

Since the catastrophic 2009 Black Saturday bushfires in Victoria, Australia the emergency services have started to implement a state and government-wide policy of "risk-based planning". Risk management has become a defining feature of Australian emergency management. However, the most recent iteration of this risk-based planning approach in Victoria is unprecedented because it places risk at the heart of a whole landscape management strategy. This strategy is driven by an integrated set of sophisticated climate modelling and bushfire simulating algorithms. Here, the word "whole" refers to the entirety of the territory that falls within the purview of the state. In this paper, I examine the kind of relationship that has to be established between risk and reason in order for this strategy to be sustained at such a grand scale. My ultimate

aim is to problematize the concept of risk. This is a timely endeavour because the assumptions underlying established theories of risk in STS currently bifurcate the concept into two kinds of things: objective risks that are produced by calculating mathematical probability; and, subjective risks that are products of the social milieu. Both approaches suffer from the same problem, namely a representation of possibility. I articulate a concept of risk that can deal with the real and therefore claim that the prediction of the future is impossible. It is not a question of the incremental improvement of models and algorithms as many emergency managers make us believe, rather we are dealing with a set of presuppositions concerning time. This paper will address what is at stake when we conceive of a probabilistically arrayed set of possible states of the world in the future.

Asthmatic Attunement, Pollen Forecasting, and the Time of Climatic Epistemologies *Alison Kenner, Drexel University*

Asthma is a chronic breathing disorder produced by environmental conditions such as air pollution, pollen, temperature and dramatic shifts in air pressure, animal dander, and mold. Many asthma sufferers use emplaced knowledge to care for their disease, attuning to seasonal weather trends, allergy symptoms, indoor building smells, and respiratory rhythms to judge when to use medication or leave a space, for example. In addition to these embodied engagements, their care practices also involve checking weather and pollen forecasts, and changing medication regimes accordingly. The local impacts of climate change, however, may be disrupting these tried-and-true care practices, which are based on, and in, emplaced rhythms that have been developed over time. In response, health professionals in cities with high asthma prevalence and morbidity rates are quickly mobilizing early warning systems and preparedness tools that can stave off flash epidemics. This paper draws on three examples of atmospheric prediction to highlight emerging climate temporalities that have been developed to help asthma sufferers navigate an increasingly unbreathable world: Interviews with more than eighty asthma sufferers; an emerging public health program for asthma management; and the uneven configuration of pollen forecasting in the United States. Using these cases, the paper describes an tenuous climatic epistemology, emerging to replace what is experienced in the body, interpreted through numbers, or relayed by doctors.

Environmental Amnesia as an Effect of Rhythmic Temporal Experience: The Dissonance of Climate Change *Ryan Kresge, Ithaca College*

Could climate skepticism be cultural? Merleau-Ponty (1986) argued that because human perceptions are tied to abstractions of sense inputs, understandings of experience may be more affected by the "expressive value" of sensation than the objective experience of sense input (6). In contrast, Elizabeth Tonkin's (1995) work on temporality interrogates the divide between aggregated "minor details" and "individuals' [sensory] perceptions" of the same details (72) thereby creating tension in understanding how individual humans perceive temporal changes. Bourdieu (1989) argues that social practices and power relations create practical apprehension whereby "the familiar world… [is] perceived as natural" (18). In this paper, I interrogate the processes of climate change denial, through analysis of a particular amnesiac defect in

Western perception of natural cycles and patterns by arguing that our musical lineage affects cultural constructions of climate and the threat of climate change. In my analysis, I use music as a tool of interrogation-dissecting two very separate constructions of music- the very linear, definite, and predictable Western forms of classical music (e.g. the rules defining counterpoint) and the cyclical and dissonant (by Western perception) Hindustani classical music (notably the rhythmic structure know as tal). I then argue that the linear progressions on which Western music is traditionally based devalue objective experience in favor of emotional amnesia and harmony, an effect that may intrinsically support the denial of objective observation of climate change by promoting a passive sensory experience.

Session Organizer:

Sebastien Nobert, Université de Montréal

Chair:

Timothy Neale, Deakin University

139. 'Evidence-making Intervention': Transforming Implementation Science 2

Papers for Open Panels/'Evidence-making intervention': transforming implementation science

Open Panel

11:00 to 12:30 pm

ICC: E5.4

'Evidence-based' policy and practice has become the dominant organising paradigm for health care and medicine in the western world. Within this, implementation science has emerged as a sub-discipline with a focus on developing methods which promote the integration of 'evidence' into healthcare policy and practice. Implementation science aims to understand how social contexts shape the delivery of 'evidence-based' health interventions, however such aims rely on range of ontological assumptions about the stability of 'evidence' and 'interventions' as it investigates the 'transferability' or 'translation' of these presumed-to-be fixed objects into new sites. This Open Panel invites papers which seek to return questions of ontology to the field of implementation science, grapple with 'evidence' and 'interventions' as objects in-the-making, and reflect critically on practices of evidence-making. We propose engagement with an 'evidence-making intervention' approach which assumes there to be no clean distinction between knowledge and practice, or context and content, and takes both 'evidence' and 'interventions' as objects produced and remade locally through implementation practices. Here, 'evidence' can be said to emerge immanently, a transient effect of its connections and disconnections with multiple other bodies of knowledge and a range of material-discursive practices, including those associated with science and policy. In keeping with the conference theme, this panel aims to bring together a transnational network of scholars with interests in the development, trial, transfer and promise of new health technologies, with the goal of transforming one of the dominant health policy and practice paradigms of our times.

Participants:

Making 'Online Counsellings' Through Policy and Practice: Multiplicity, Friction and the Potential for Advocacy *Michael Savic, Monash University; Ella Dilkes-Frayne, The Australian National University; Adrian Carter, Monash University; Renata Kokanovic, RMIT University; Victoria Manning, Monash University; Simone N Rodda, University of Auckland; Dan I Lubman, Monash University*

Online counselling services for a range of health conditions have proliferated in recent years. However, there is ambiguity and tension around their role and function. In line with recent critical analyses of policy and interventions, in this paper we take an evidence-making intervention approach to examine how online counselling is made in policy and through processes of local implementation. Specifically, we analyse how online alcohol and other drug counselling interventions and knowledges are enacted in Australia's drug policy, and compare these enactments with an analysis of information about, and data from, Australia's national online alcohol and other drug counselling service, Counselling Online. We suggest that while the policy enacts online counselling as a brief intervention targeting alcohol and other drug use, and as an avenue to facilitate referral to face-to-face treatment services, in its implementation in practice online counselling is enacted in more varied ways. These include online counselling as attending to alcohol and other drug use and interconnected psychosocial concerns, as a potential form of treatment in its own right, and as supplementing face-to-face treatment services. Rather than viewing online counselling as a singular and stable intervention object, we suggest that multiple 'online counsellings' emerge in practice through local implementation practices and knowledges. While it is important that policy makers, clinicians and researchers acknowledge the emergence of, and frictions between, multiple intervention objects in policy and practice, we also reflect on the potential for 'evidence' of this multiplicity to be used by services to advocate for greater funding.

On The Construction Of Evidence: Medical Practices Of Identifying Sexual Violence *Ulrike Tikvah Kissmann, University of Kassel*

The phenomenon of violence always was object of scientific categorization and classification. Significantly, as Ian Hacking (1999) has pointed out, in the 1960s the visualization of bone fractures through x-ray allowed the social construction of „the battered child syndrome". Visualization still remains an important tool to identify child abuse (e.g. Tsokos & Guddat 2014). This paper will analyse the working practices of a walk-in clinic for sexually abused children in Germany. Hospitals increasingly provide special walk-in clinics for victimized infants, because injuries involving infants are often minimized by regular pediatricians and hospital staff. The project aims at studying doctor-child consultations, in order to understand the practices of seeing, measuring, reading and writing from an ethnographic perspective. It especially focusses on the documents that are used and asks how they furnish scientific evidence of sexual violence. What underlying concept of evidence-making intervention is utilized? What does visualization contribute to it? Literature: Hacking, Ian (1999): The Social Construction of What? Cambridge and London: Harvard University Press. Tsokos, Michael & Guddat, S. (2014): Deutschland misshandelt seine Kinder. München: Droemer.

Between Boundary Objects and Trading Zones: Fugitive Thinking on the Cusp of Educational Policy and Practice. *Andrew McLachlan, The University of Sydney*

Integration is one of the most frequently invoked educational ideas in school-wide planning. Yet depending on the situation, it can be used variably to refer to integrating teaching aims, integrating syllabus content,

integrating the 'real world' with the classroom, and integrating knowledge within the individual. This paper attempts to expand on recent Science and Technology Studies scholarship by considering whether implementation constructs like fidelity, integration and adaptation are not only translated through locally meaningful actions, but give rise to novel translational practices themselves. The paper will draw on research conducted at an Australian primary school over two years to examine the implementation of the national mental health and wellbeing initiative - KidsMatter Primary. Borrowing from Stefano Harney and Fred Moten (2013), it argues that operative constructs like integration are not so much variable in their form and function as they are 'fugitive'. The paper thus considers the ways in which such an institutionally stable concept like 'integration' proliferates in the midst of an ordinary teaching day. It attempts to address a simple problem: in situations where evidence is so often a question of who and what to defer to, how do teachers go about their own fugitive thinking when working with expert knowledge? How is practice-based evidence practised amidst the confluence of educational and psychological expertise? Key words: translation, implementation, integration, fidelity, adaptation.

Session Organizer:
Kari Lancaster, UNSW Australia
Chair:
Kari Lancaster, UNSW Australia

140. Digital Imperialism: Colonizing Everyday Lives in the Global South II: Techno-Discourses and Resistances
Papers for Open Panels/Digital imperialism: colonizing everyday lives in the Global South
Open Panel
11:00 to 12:30 pm
ICC: E5.5
Participants:

"Already Global Local": Complicating notions of innovation and expertise in Africa *Leah Horgan, University of California, Irvine; Angela Crandall Okune, University of California, Irvine*
Critiques of development have well established the problematics of top-down development initiatives and implements (Escobar 2001; Ferguson 1990; Toyama 2015; Kuriyan et al. 2008). Similar issues located in the rhetoric and practice of "participation" are also by now widely disseminated (Cooke and Kothari 2011; Hickey & Mohan 2004). Thus, today's generation of designers, development practitioners, and academics are aware of the importance of taking context and local perspectives into consideration when designing projects, products, and interventions. However, we argue in this paper that the Information Communication Technologies in Development (ICTD) community's response to such critiques has manifested in an over-reliance on promoting "local innovation"—and a narrow conceptualization thereof—as the counter-weight to the pitfalls of "foreign technology." A dichotomy of "local" and "foreign" misses the "already global local": African consumers and producers of technology already exposed to and operating with technology platforms built in and for the West. Ensuring a technology is customized for the "local" market or context, or built by or with "local" input, misses

the complicated global flows of design and technological production—especially the relationship between technologists and their end-users—and raises long-standing feminist and anthropological questions about what it means to know the Other (Trouillot 1991; Bunzl 2004). Dominant narratives about the "local" are unable to account for the broader histories or the situated nature of knowledge (Haraway 1991). We argue that the concept of "local" (and, concomitantly, "global") should be expanded to transcend essentialized categories and complicate the intersections of subject positions, carving out a space for the existence of "already global local" expertise and production.

Exploring National Policy, Practice and Global Narratives That Shape The Internet in Nepal *Nischal Regmi, Martin Chautari; shailesh pandey, Martin Chautari*
There is a strong impetus for a rapid increase in Internet connectivity in Nepal. The common thread in the narratives, in the late nineties and second half of 2010, is the optimism mediated by certain technological innovation. The emphasis on infrastructure development is the desire to leapfrog to higher levels of development by transitioning into a 'knowledge-based society and economy', which is afforded only by specific technologies of the time. It was computer and Internet in the late nineties. Now its mobile phones and broadband Internet. The global village imaginary and inevitability associated with connectivity in policies leave no room for the possibility of no or limited impact as probable outcomes. They enforce the need to join the rest of the world. We agree these conceptualisations offer justification to the neoliberal projects. In this paper, we show the persistent inequality in the connectivity landscape onwards from the late nineties, where liberalisation of the telecommunication sector was believed to spur economic growth and overall social transformation. We find the enthusiasm governed by two key assumptions: (i) connectivity is purely a technical challenge as opposed to socio-technical; and (ii) challenges associated with the adjacent infrastructure (such as energy) can be solved in isolation. Such assumptions are carrying on the agendas set by institutions like the World Bank and UN (ITU). We challenge both assertions and provide evidence to forego such simplistic vision of connectivity. We analyse census, surveys and official statistics to bring to the fore the ungrounded simplistic vision of connectivity.

The Biometrics Regime As New Outpost of Technological Imperialism: Narratives From Peoples Everyday Lives In India. *RAJIV KUMAR MISHRA, Centre for Studies in Science Policy, School of Social Sciences, JNU, New Delhi, India*
A village farmer reflects upon the value of his biometrics enabled identity being more important than his value as a farmer, doing agriculture. It certainly has a strong sense of reflection on what contemporary India has rapidly acquired as a technological means to govern people's lives. Being part of the global south this emphasis is being strongly driven by neoliberal ideas/ways of technology enabled development from the global north. In this process different actors and institutions at the global, national and local level play their role, thus forming a regime. In this context and setting, the paper explores the forms of the regime defining the discourse on biometrics

enabled development; setting the agenda for its use; facilitating entry of technology with (north driven) global policies of development; and creating grounds of profitable businesses for all players in this system. The paper thus will analyze/unpack the understanding of the larger structure of technological imperialism being impelled by forces from global north to replicate the sense of modernity in south, and how the biometrics regimen has come to be its new outpost. The theoretical approach of this paper will intersect both Science, Technology and Society (STS) studies and Post-Colonialism. Using various narratives from in-depth qualitative interviews as a part of ongoing fieldwork, the paper's argument will be based on ethnographic data and empirics to reflect the realities of biometrics regime in everyday life in Indian villages.

Session Organizer:
Mathieu Quet, IRD

141. The Edible, the Moldy, and the Weedy: Speculative and Materialist Interventions into (Evading) Capitalist Capture
Closed Panels
Traditional (Closed) Panel
11:00 to 12:30 pm
ICC: E5.6

This panel calls attention to the transnational discards of globalization's promises. Though often overlooked as "ugly" and "disgusting" things, mold, fungi, slime, and mucous can constitute wondrous and elusive forms of life, as well as complex materials with which to think about legacies of empire and the asymmetrical distribution of life chances around the world. At times, they can model collective organizing, collaboration, and cooperation in the face of ever more aggressive human moves to privatization. In other instances, their entanglements with other species contradict androcentric narratives about securitization and health. Taking up humanistic and historical perspectives to study a range of investments and revaluings of molds, fungi, and industrial dairy waste, this panel contributes to the social study of science by emphasizing how transnational contexts prove key to understanding trans-species intra-action (e.g., the militarized histories of cellulolytic molds, linked in mass media to "toxic black mold," the postwar spread of fungal blast that is destroying rice harvests, as well as the uneven terrain across which powdered milk gets distributed in the Global South and why). Sharing a commitment to feminist, decolonial approaches to science and technology studies, these panelists pull old and new materialisms into conversation to intervene in capitalism's production of fungible and disposable, non/human life.

Participants:
Stachybotrys chartarum's Transpacific Migrations *Rachel C Lee, UCLA Center for the Study of Women*
In her presentation, Rachel Lee revisits the filamentous fungi Stachybotrys chartarum, said to be responsible for horses (between 1920 and 1940) in Russia and Hungary becoming ill after eating moldy hay. Fifty years later (in 1993-4) Stachybotrys was linked to outbreaks of pulmonary distress in African American infants living in water-damaged houses in Cleveland. This presentation examines the entanglement of military exploits, racialized residential patterns, and frontiers of new drug research by way of the perceptible travels of Stachybotrys. From the outset, US research into cellulose-eating fungi was linked to transnational endeavors. That is, concerns of the U.S. military over the compressed serviceable life of their

tarps, tents, and sandbags, while stationed in Southeast Asia, led to the creation of a massive collection of cultures from fungi taken from "deteriorated materials from military bases from the Pacific" (J. Miller, et al, 2003), housed at the US Army Quartermaster Laboratories. A class of metabolites of S. chartarum-- spirocylic drimanes--were also patented by Japanese researchers as a potential immunosuppresant. While English-language mainstream media interest in Stachybotrys has centered upon its possible role as a contributor to "indoor mold" and DBRI (damp-building realted illness), or what Michelle Murphy calls "sick-building syndrome," a transnational lens onto the filamentous fungi reveals the way in which Stachybotrys research has recently transited to a further oceanic milieux: the spirocyclic drimanes of the marine classes of the fungi (class: Sordariomycetes, order: Hypocreales), being mined for their novel bioactive chemicals and for potential capitalization by the drug industry.

Healthy Harms and Fat-Free Futures *Athia Choudhury, University of Southern California*
This paper lingers in the odor of 1920's U.S dairy creameries—the stench after-fat. The curdles of putrid waste from the creaming process for butter and whole milk seeped into streams, pits, and soiled patches of the American pastoral. Faced with the conundrum of marketing milk as a wholesome, national, and nutritious food, dairy corporations developed technologies to turn the environmental waste of the creamery into profit. Melanie Dupuis offers that "the perfect whiteness of this food and the white body genetically capable of digesting it" are tied into ways in which powdered milk was disseminated across rural villages in India, Africa, and South America as humanitarian aid and scientific advancement. Though there has been considerable scholarship on how powdered skim milk capitalized on colonial legacies of power differentials to target Global South populations, there has been very little consideration on the matter of fat/ness. This paper connects "fat-free" skim milk and its rise as a diet industry cult favorite to the imperial food production of powdered milk as intersecting across environmental waste management and shifting ideas of health. Skim milk and powdered milk produced new socialities, digestive processes, and perceptions of bodies. "Healthy Harms" intertwines fat and the gut, aesthetics and technology across biological, ecological, and bioethical discourses to interrogate the intersecting registers of corporeal governmentality of human/nonhuman life.

Queering Physarum polycephalum *Aimee Bahng, Pomona College*
The ostensibly surprising intelligence of Physarum polycephalum has made popular science news headlines over the past several years, as it gets taken up by urban planners and computer scientists who not only marvel at the combination of its penchant for efficiency and adaptability but also use the slime mold to model network arrays. Octavia E. Butler, whose life's work involved using the generic medium of science fiction to imagine worlds otherwise, looked to slime mold's queerer behaviors as inspiration for formulating non-hierarchical socialities and even more radical onto-epistemological modes of living in common. In this presentation, I mean to interject Butler's thinking beyond the human into the

flurry of critical interest in Sylvia Wynter's critiques of "the human" as an Enlightenment category that fueled its fanciful liberation with the relegation of many to the inhuman. Drawing on queer-feminist materialisms, I inquire after how slime molds and other colony organisms push back against androcentric notions of individualism and competition that feed all-too-conveniently into capitalist capture. The plasmodial improprieties of the amoebic myxomycetes Butler queried constitute a radical challenge to more entrenched narratives of how organisms organize themselves. Through a combination of close reading of Butler's notes and fiction and a broader engagement with histories and philosophies of science, I argue that her speculations provide a rich, alternative archive for feminist-queer science studies to examine as it focalizes collaborative and collectivist frameworks for conducting science queerly.

Preserving (American) Values, Preserving Race: Anatomical Models and the (Chinese) Human *Ari Heinrich, UCSD*
As advances in biotech displace more conventional understandings of the relationship of identity to the human body, placing scientific and medical aesthetics into dialogue with political economics—or a critical engagement with "biopolitical aesthetics"—becomes increasingly important. This paper looks at what happens to aesthetics when unprecedented advances in biotech meet the commercialization of medicine in the public sphere. Focusing specifically on questions of constructions of Chinese identity in American and Australian formulations of biotech, in this paper I critique American and Australian reception of the lucrative but controversial plastinated human body exhibits (frequently associated with critiques of Chinese human rights violation) created by the German anatomist Gunther von Hagens in the mid-1990s. Diverging from formulaic critiques of the Body Worlds as illustrative of 'Chinese human rights violation' narratives, this paper compares reception of individual exhibits in Sydney, New York, and California, with reception at "home," e.g., in media from China, Taiwan, and Hong Kong. It concludes that a critical reassessment of human rights discourse in Australia and the United States in light of Chinese-language discussions of the same exhibits can clarify our understanding of both the nature of the "human" and the nature of "Chineseness" in contemporary biopolitical life.

Session Organizer:
Aimee Bahng, Pomona College
Chair:
Melinda Cooper, The University of Sydney

142. Messing with Methods in More-than-Human Worlds II
Papers for Open Panels/Messing with Methods in More-than-Human Worlds
Open Panel
11:00 to 12:30 pm
ICC: E5.7
A multitude of political, technoscientific and ecological disruptions are challenging the 'myth' of human exceptionalism, forcing researchers to find new ways of understanding, and intervening in, a range of human/nonhuman encounters. From reconfigured definitions of 'agency' and the 'social' to renewed explorations of 'co-presence' and 'mutual becoming,' more-than-human approaches can exemplify Donna Haraway's invitation to 'stay with the trouble' of human/nonhuman entanglements. But actually

doing this research is hard. There is still a tendency, as David Abram puts it, to speak "about such entities only behind their backs," instead of actively calling out and listening to them. And when we do succeed with that task, we still face the challenge of how to (re)tell these stories, or even trickier, how to 'take action.' This 3-part session provides a space for a collective, transdisciplinary effort to consider these methodological possibilities and limitations, and to share even our messiest experiments in creating and communicating knowledge necessary for thriving in more-than-human worlds.
Participants:
More-than-human encounters with clothing: Experiments in sociological sewing *kat Jungnickel, Goldsmiths*
Clothing is a ubiquitous, mundane and essential feature of everyday life. It is central to how we protect ourselves from the elements, how we move (and don't move), perform, organise and make sense of society, each other and ourselves. It reveals much about how we live in the present, remember the past and imagine the future. We tell stories with clothing, and it tells stories about us. This paper considers clothing as a site of TRANSformation, TRANSmission and TRANSlation. I focus on radical new forms of cycle wear designed, made and worn in the late nineteenth century by inventive women. The most remarkable of these are convertible costumes that enabled wearers to secretly switch ordinary clothing into cycle wear when needed. We know about them because many of these women also patented their designs. Given the lack of existing artefacts, the project involved making and wearing these costumes as a means of getting closer to the women who lived over a century ago and the social conditions which fired their imaginations. I ask what happens when cycling, sewing and sociology collide. What emerges from making garments that differs from analysing documents? And, what can we learn from wearing the clothes of others?

Food for thought: materialising the more-than-human in design pedagogy. *Danielle Wilde, University of Southern Denmark*
Increasingly, designers are collaborating with other species to develop alternate material practices. Yet, these practices and the associated politics are not yet well mapped, and pathways for sharing can seem elusive. In an attempt to redress this imbalance, we performed a series of moves to introduce biology as a collaborative material practice into a design education, in a small town in Denmark. Beginning with Waag's BioHackAcademy, we built a lab and tried to biohack design practice. Following resistances, we turned to young adults not yet conditioned by education or professional experience and—with 100 Year 8 students from two local high schools—biohacked the high school science curriculum. Finally, with a group of Masters students, we biohacked the NordicBaltic BioLabs Symposium on Food+[material practices]. These activities uncovered opportunities and resistances around multi-species design, and led to a new research program, Food for Thought: using food and eating as starting points for thinking. Eating is intimate, mundane—socially, culturally and politically potent—aesthetically rich and essential to life. Whether human, antelope, plant, funghi or bacteria, we eat to survive and to thrive. Food for Thought asks how shared and complementary concerns around food and eating might better entangle the desires of different living beings on our fragile planet. Can we eat to thrive, flourish, and grow together? Can food provide a

much needed frame for thinking? Our reflections, small triumphs and stubborn resistances contribute to mapmaking multi-species practices in design pedagogy, through materially engaged responses to such questions.

Rethinking using assemblages in more-than-human methods: Towards a decolonised toolkit? *Kim McLeod, University of Tasmania*

When I came to investigate wellbeing and antidepressant use some years ago I felt a strong political imperative to avoid the blaming associated with the individual notion of wellbeing. I staged a methodological experiment: instead of enacting the individual, I put the assemblage concept to work during each stage of an empirical research project exploring how people experience antidepressant use (McLeod 2014). I was satisfied with the experiment, particularly because the knowledge generated by the project did not reinforce the blaming of individuals. However, as a white academic living on Aboriginal lands in Australia, I need to attend to additional political implications relating to using these methods. In this project, I did not acknowledge the specificity of the Euro-centred posthuman theorising that underpinned my methodological experiment, nor did I acknowledge Indigenous non-dualistic relational epistemes and ontologies (Todd 2016; Sundberg 2014). I am propelled ask if it is possible to use more-than-human methodological tools in ways that do not re-enact the colonial gesture? And specifically, can using assemblages in more-than-human research methods be part of a methodological toolkit for decolonisation? I explore this question by drawing on decolonial and postcolonial scholarship, critical improvisation studies, and insights from voice improvisation practice. This paper contributes to the conversation about how more-than-human methods might ally with decolonisation, in STS and the social sciences more broadly. McLeod, K. 2014. Orientating to Assembling: Qualitative Inquiry for More-Than-Human-Worlds. International Journal of Qualitative Methods. Vol 13, 377-394. Sundberg J. 2014. Decolonizing Posthumanist Geographies. Cultural Geographies. Vol 21 (1) 33-47. Todd, Z. 2016. An Indigenous Feminist's Take on The Ontological Turn: 'Ontology' Is Just Another Word For Colonialism. Journal of Historical Sociology. Vol 29, 1 March.

"Dammed Waters": On Multiple Ontologies, Materiality Of Infrastructure And Future Dams In South Africa *Thando Mcunu, University of Cape Town*

Science and Technology Studies around infrastructure have tended to see and relate to dams as being inanimate objects which engineers know all about. That is not entirely the case. The ontological and a more-than-human understanding of dams as being relational and living objects which undergo changes and have a dynamic relation between living and non-living actants I propose can better inform and benefit STS. Dams I intend to show are constantly communicating through the agency of materials used and reading external forces. This work is an attempt to rethink and re-imagine the relationship people have with dams as being merely inanimate objects rather the water it stores gives it life and dynamism by responding to changing water levels. South Africa is well known for some of the pioneering dam builders in the world and several engineering innovations. The most notable example is the Berg River Dam Project in the affluent area of Franschhoek in the Western Cape, which has received international recognition for its integrated planning, design and implementation in dam construction. This dam site has been pivotal for number scientific researches which have studied primarily the chemistry, biology and limnology of the area; with limited ethnographic research. Using qualitative research methods of sensory ethnography, participant-observation, ethnographic interviewing and document analysis I will inquire on the multiple ways the dam speaks and how people the ways people relate and understand the Berg River Dam.

Session Organizer:
Larissa Hjorth, RMIT
Chair:
Jaz Hee-jeong Choi

143. **Bioeconomies - Life, Technologies, and Capital in the 21st Century II: The Reproductive Bioeconomy**
Papers for Open Panels/Bioeconomies – Life, Technology, and Capital in the 21st century
Open Panel
11:00 to 12:30 pm
ICC: E5.8
This session explores the variety of social, economic and political aspects emerging around technologies and practices associated with the global reproductive bioeconomy. It includes issues of kinship, care chains and gender, as well as valuation process and markets.

Participants:

Bioeconomies of Egg Provision in the United States and Spain: Comparing Medical Markets and Implications for Donor Care *Diane Tober, University of California, San Francisco; Vincenzo Pavone, Consejo Superior Investigaciones Cientificas (CSIC)*

Regulatory systems governing third party reproduction determine how people providing reproductive materials and labor--including eggs, sperm, and gestational surrogacy services--are selected and compensated. The United States and Spain have very different regulations surrounding third party reproduction, but are both global leaders in providing fertility treatment with donor eggs. We examine how two key differences between these systems--how donors are compensated and selected--influence the broader market in human eggs and the implications for women who provide them. Drawing on interviews and fieldwork in the United States and Spain, this paper compares how compensated egg provision operates under a regulated public/private system (Spain) and the unregulated US free market medical system. Here we explore how different reproductive bioeconomies (Pavone and Goven 2017) influence the bioavailability (Cohen 2008; Tober and Nahman 2018) of some women over others in the human egg market. In addition, we posit that advances in egg freezing technologies—and the rise of egg banking--may further drive consumer culture fertility care in both locations (Tober and Pavone, 2018).

From ARTs to TRCs: Egg donation as key for the Spanish reproductive bioeconomy *Sara Lafuente Funes, Institute of Public Goods and Policies (IPP) - Spanish National Research Council - CSIC*

More than 8% of babies born in Spain are conceived through assisted reproduction techniques (ARTs). Almost 4 out of 10 babies born after direct-IVF depend on egg

donation, presented as clinics' "most successful technique". Even though Spain has a solid and reliable public healthcare system, ARTs developed mainly in the private sector. This, along with the expansion of reproductive tourism, made the Spanish reproductive bioeconomy expand greatly. Drawing on qualitative research within reproductive clinics, this research argues that egg donation fuels the bioeconomic model of reproduction in Spain by taking advantage of the reproductive capacity of certain women rather than by (only) assisting reproduction. Furthermore, it argues that these donated eggs assist far more than what it seems at first glance. Egg donation is here described as a socio-technical practice of transference of reproductive capacity (TRC) rather than as yet another ART. TRC is a useful concept for separating ARTs from what they render possible, making more visible the role of donors and eggs on achieving certain pregnancies, and allowing to focus on how their use today is linked to reproducing certain (heteronormative) families and certain (neoliberal) economies. Finally, this work argues that donated eggs assist women who receive them, but also men and heterosexual couples in their desire to maintain paternal genetics. Furthermore, TRCs work through ARTs by enlarging the number of patients that can be treated and by increasing the success rates of both these techniques and the particular clinics applying them, assisting both clinics and ARTs themselves.

Perverse Markets: How the expanding ART bioeconomy in India contributes to the infertility-burden. *Bronwyn Parry, King's College London; Rakhi Ghoshal, Unitedworld School of Law*

ARTs, a leading driver of the global bioeconomy networks have significantly re-ordered relations between the body, labour and the market. In this paper which draws on four years of empirical research we examine the emergent political-economy of this sector in India. When ART here began to evolve into a commercial market the poor lingered at its periphery, offering, most commonly, their wombs on rent or ova for sale. Infertility in India is, however, a profound social impediment, its cultural stigma leaving few unmarked. Seduced by the 'promise' of these 'salvationary' technologies, the poor have become a new class of consumers for a market seeking to expand beyond its existing and affluent consumer base. Mobilising tropes of 'reproductive inclusivity' ART clinics have since mushroomed across India's rural landscape. Here we map the extent of this market expansion before critically examining how prototype rural ART clinic disorder inclusivity by generating ill-informed and incorrect decision-making, sabotaging patient rights, adding to the financial burden of such families whilst, perversely (re) producing infertility itself. Paradoxically; even as India invokes sweeping new ART legislations these clinics and their practices remain unregulated, hiding in plain sight. While the State obsesses about protecting commercial surrogates it barely registers the violations that such clinics routinely visit upon impoverished infertile couples. Over-protection of 'the poor' subject when she provides commercial reproductive labour for ART and nonchalance towards her when she becomes a consumer of the same technology points to the deeper contradictions and ethical entanglements that characterise this emergent bioeconomy.

Printing the body of the future: The bioeconomics of human bioprinting *Céline Lafontaine, University Of Montreal*

Based on ethnographic data collected in a French bioprinting start-up and a series of interviews with various French researchers in this field, this paper aims to show that human tissue and organ bioprinting is emblematic of the bioeconomy of the human body. In line with the promise economy, the field of bioprinting is characterized by a wide gap between the hopes it raises in the field of personalized medicine (i.e. individualized tissues for drug testing) and those of regenerative medicine (tissue replacement and organ transplant) as they relate to concrete research result. Despite the number of sociotechnical hurdles identified by researchers, they nevertheless support a futuristic and optimistic vision of bioprinting. This promise economy can be understood within the context of the financialization of research. Our ethnographic analysis reveals that the French start-up model creates a positive uptake by researchers about the futuristic potential of bioprinting. Because this field of biomedical innovation rests on a stem cell bioeconomy, we will explore the economic and social impacts of bioprinting as they relate to the status of bioprinted tissues. More concretely, we will show that current production of bioprinted tissues is more in line with the pharmaceutical industry than regenerative medicine, although the latter plays a greater role in serving the promise economy. Finally, we will examine how promissory discourse encourages a culture of experimentation among patients in the context of neoliberal biocitizenship.

Regimes of value in the development of genetic tests, 1960 to the present *Steve Sturdy*

Diagnostic and predictive testing for genetic factors in health and illness has expanded enormously since the 1960s, both in volume and in the range of medical uses it. Over the same period, the production and delivery of genetic and other diagnostic tests has increasingly been taken over by commercial companies, with some tests now enjoying sales that place them in the blockbuster category alongside pharmaceuticals. Yet the growth of the diagnostics sector has received nothing like the scholarly scrutiny that has been devoted to the pharmaceutical sector. This paper makes a foray into this neglected field by asking what kinds of value – including but not confined to market value – genetic tests have delivered since the 1960s. The paper offers an overview of developments in Britain and Europe, based on historical examination of mostly published sources and grey literature. It analyses the findings using the concept of "regimes of value" (Appadurai) to sketch a history of how genetic tests have been endowed with value by changing configurations of patients, clinicians, biomedical researchers, public health practitioners, commercial investors and government policy makers among others in the decades since 1960. Specifically, it asks how these different constituencies have valued the power of genetic testing technologies to discriminate between different biomedical conditions and predispositions. In so doing, it aims to illuminate the sociocultural factors that encouraged the development of ever more discriminatory genetic testing technologies, including the growth of commercial and political interest in the economic value that such technologies could deliver.

Session Organizer:
Vincenzo Pavone, Consejo Superior Investigaciones Cientificas (CSIC)
Chair:
Tess Doezema, Arizona State University

144. SpiralSpace: Atemporal Approaches to Post-Cyberfeminism
Closed Panels
Traditional (Closed) Panel
11:00 to 12:30 pm
ICC: E5.9

[F]or mutants there can no longer be any Last Judgement, or the resurrection of the body, for what body will one resurrect? -- Baudrillard If cyberfeminism is a radically 'mutant' feminism, can it ever be truly obsolesced? What does it mean to invoke a 'post-cyberfeminism'? This panel will interrogate the temporal presuppositions behind the academic term 'post-cyberfeminism', and attempt to offer alternative means of thinking a cyber/techno/xeno -feminist relation to time through technologies of weaving, folding, knotwork and looping, patchwork, prophecy, and infection. The panel will comprise 5 panellists presenting 3 papers from Amy Ireland, Alice Farmer and Virginia Barratt and one poetic/codeworked piece from Linda Dement in response to the provocation "spiral space: atemporal approaches to post-cyberfeminism". Francesca da Rimini will act as reflectant in the spirit of Zenitizma.

Participants:

Scrap Metal and Fabric: Weaving as Temporal Technology *Amy Ireland, University of New South Wales*
This paper takes Sadie Plant's riff on the Nietzschean prophecy of the 'people to come' that famously closes Zeros + Ones as the entryway into a mystery encompassing weaving, secrecy, time anomaly, monsters, artificial intelligence and a patchworked terrestrial future.

Retro Chronomancy: Eschewing the Linear Temporal *Alice Farmer, New Centre for Research And Practice*
The immateriality of the notion of "ideas" means there's no need for the assumption that ideas are bound to materiality which is so wrapped around and prevalent in current theoretical discourse. Hyperstition, Pigeonhole experiment, Lemurian Time War have challenged our understood notions of a linear temporality–Kant identified that it was instead the way we understand the changes in objects in relation to each other, and Sadie Plant – a key figure of Cyberfeminism – and Manuel de Landa realised, and asserted the need to show that history – and thus time – is nonlinear. How can we identify the ability for ideas to influence the past? What does this mean for theoretical currents?

The stream inside the stream: eroding cyberfeminisms *Virginia Barratt, Western Sydney University*
We do not grow absolutely, chronologically. We grow sometimes in one dimension, and not in another; unevenly. We grow partially. We are relative. We are mature in one realm, childish in another. The past, present, and future mingle and pull us backward, forward, or fix us in the present. Anais Nin (1903–1977)[61] Cyberfeminism is more of a flow than a form, exerting pressures and intensities which gives rise to diverse mutations of (cyber)feminisms. Some of these are on a line of flight towards institutional forms of academic cyberfeminism and others might form small rocky outcrops which are perpetually accreting and eroding to fall back into the stream, to spiral in exoteric time,

transgenerationally, meeting other forms with every pass, joining streams, producing mutant ectogenetic offspring in a pre-temporal matrix.

Codeworked poetry *Linda Dement, Artist*
The spiral makes recursive calls and accretes with each pass, compounding, exponential, thickening time to space. Cyberfeminist infections wick along fibres of the timespace spiral to re-infect and mutate themselves in endless expansions. We slice in with code to patch into the gaping slits, unsupportable occultist data, yearnings through the bio-ports and as many conflicting wisdoms as can be found.

Session Organizers:
Thao Phan, University of Melbourne, Australia
Sally Olds, University of Melbourne
Emma Black, University of Queensland
Chairs:
Sally Olds, University of Melbourne
Emma Black, University of Queensland
Thao Phan, University of Melbourne, Australia
Discussant:
Francesca Da Rimini, University of Technology Sydney

145. 2018 Bernal Prize: A Conversation with Trevor Pinch (virtual participation)
Single Paper Submission
Plenary Session
11:00 to 12:30 pm
ICC: Parkside 1

Please note that Trevor Pinch will be participating virtually for this session The 2018 Bernal Prize has been awarded to Trevor Pinch, Goldwin Smith Professor of Science & Technology Studies at Cornell University in the United States. Along with a wide and expanding network of colleagues, Pinch's work on the social construction of technology (SCOT) has shaped scholarship in STS for close to four decades. This work has opened a space for empirically oriented social, cultural and historical analyses of technology to successive generations of scholars. At the same time, Pinch's own research focus has continued both to deepen and to change, moving most recently into the sociotechnologies of sound. This session will feature a screening of a recorded conversation with Trevor Pinch introduced by Lucy Suchman (Chair of the 2018 Bernal prize committee), and followed by responses from Pinch (joining us remotely from Ithaca, New York) and three colleagues reflecting on Pinch's contributions to his students, his colleagues, and the field. Panellists: Simone Tosoni, Università Cattolica del Sacro Cuore, Milan Chia-Ling Wu, National Taiwan University, Taipei Sally Wyatt, Maastricht University, The Netherlands
Session Organizer:
Kim Fortun, University of California Irvine
Chair:
Lucy Suchman, Lancaster University

146. Pseudoscience in Popular Culture—a Musical Conversation
Single Paper Submission
Special Event
12:30 to 2:00 pm
ICC: C2.1

The "Dust Bowl" of the 1930s U.S. is one of the world's most "celebrated" ecological disasters. A perfect storm of circumstances (a record-breaking drought, the opening of a fragile ecosystem to exploitation, greed and poverty, the rise of industrial agriculture, the rise of global commodities trade) resulted in massive topsoil loss and the ruin of a 100 million acre grassland (about half the size of New South Wales). What role did pseudoscientific theories

play in guiding or unleashing these events? Where do we see similar processes going on today? Coincidentally, the Dust Bowl also birthed a new era of American folk music, much of which can be traced to the prolific and subversive writings of Woody Guthrie. 4S's own Administrator, Steve Coffee, has now brought this musical connection full circle by writing a "folk opera" that illuminates this environmental catastrophe from the inside out. "Rain Follows the Plow" tells the story of a West Texas farm family caught up in the hubris, the faith, and ultimately the suffering and remorse as their utterly natural ambitions literally bring their world down around them. In this informal and unpredictable session, Coffee and a band of intrepid Aussie folkies will offer a selection of songs. Science Journalism Professor Susan Swanberg (University of Arizona) will offer perspective. Matthew Kearnes, conference co-Chair and member of the Environmental Humanities group at UNSW, will moderate audience discussion. Bring a lunch and join the fun!

Session Organizer:
    Stephen Coffee, Chaos Abatement

Chairs:
    Matthew Kearnes, Environmental Humanities Progarmme, School of Humanities and Languages, University of New South Wale
    Susan Elizabeth Swanberg, University of Arizona

147. 6S Business Meeting
Single Paper Submission
Business Meeting
12:30 to 2:00 pm
ICC: C2.2

The Society for Social Studies of Science Student Section (6S) Business Meeting - We welcome all students and early-career scholars to discuss how the Student Section of the Society for Social Studies of Science (6S) can best support our needs as a community and our vital role as part of the 4S community in the upcoming year.

Session Organizer:
    Erika Amethyst Szymanski, University of Edinburgh

148. Australian-French STS Researcher Networking
Single Paper Submission
Lunchtime Workshop
12:30 to 2:00 pm
ICC: C2.4

This would be a networking event for French and Australian STS researchers interested building links. The event would be sponsored by the Australian-French Association for Research and Innovation (AFRAN). We would seek the conference organisers assistance in publicising the event. We have no preference for date or time at this point although there is the potential for schedule conflict since key AFRAN personnel are involved in some panel sessions.

Session Organizer:
    Jan Hayes

Chair:
    Jan Hayes

149. Arts + Science Dialogues: The Karrabing collective and filmmaking as survivance
Single Paper Submission
Special Event
1:00 to 2:00 pm
ICC: C2.5

The Karrabing Film Collective is a grassroots Indigenous based arts and film group. In Emmiyangal, "karrabing" refers to the saltwater tide when it reaches its lowest reach. There is nothing "low" about the tide reaching karrabing. All kinds of potentialities spring forward. For Karrabing, their medium is a form of survivance – a refusal to relinquish their country and a means of investigating contemporary social conditions of inequality. This session involves a short film screening followed by a discussion and Q&A session with Beth Povinelli, chaired by Eben Kirksey

Session Organizer:
    Michaela Spencer, Charles Darwin University

Chair:
    Eben Kirksey, Deakin University

150. Indigenous STS Plenary
Closed Panels
Traditional (Closed) Panel
2:00 to 3:30 pm
ICC: Parkside 1

Early its emergence as a discipline, some STS scholars looked to Indigenous knowledges as a resource to question the dominant framings of science. However, it has been suggested that this did not lead to the field forming deep engagements with either Indigenous scholars, Indigenous perspectives on science, or Indigenous knowledges. The range of scholars and topics that have been prominent at 4S conferences in recent years demonstrate that this situation may now be changing, with a renewed interest in such matters as Indigenous peoples' past and present encounters with scientific institutions and logics and how scientific research and STS alike might be 'indigenised'. The 2018 conference will take this opportunity to stage a plenary panel to critically inquire into what an 'Indigenous STS' is, or may yet be.

Participants:
    Indigenous STS Plenary *Kim Tallbear, University of Alberta*
    Indigenous STS Plenary *Kyle Whyte, Michigan State University*
    Indigenous STS Plenary *Marama Muru Lanning, University of Auckland*

Session Organizers:
    Timothy Neale, Deakin University
    Yih-Ren Lin, Taipei Medical University

Discussants:
    Kyle Whyte, Michigan State University
    Lynette Russell, Monash University
    Marama Muru Lanning, University of Auckland
    Kim Tallbear, University of Alberta

151. 4S Honors and Futures
Single Paper Submission
Plenary Session
4:00 to 5:30 pm
ICC: Parkside 1

This session will honor 4S's 2018 prize winners and open a discussion about the future of 4S and how it can best support STS scholarship, teaching and practice in coming years.

Session Organizer:
    Kim Fortun, University of California Irvine

152. 4S Sydney 2018 Banquet
Single Paper Submission
Special Event
6:30 to 9:30 pm
Museum of Applied Arts & Sciences: Turbine Room

The 4S Sydney 2018 banquet/conference dinner will be held in the striking Turbine Hall of the Powerhouse Museum. At this cocktail-style event, contemporary Australian canapés featuring seasonal flavours and local produce will be served beneath aircraft suspended above, while guests will have the exclusive opportunity

to explore the exhibition Human Non Human that will feature in the space during the conference. The banquet will also include a smoking ceremony by Uncle Jimmy Smith.

Session Organizer:

Kim Fortun, University of California Irvine

SATURDAY, SEPTEMBER, 1

153. Affordances and Architectures: A Materialist Approach to Digital Design 1

Papers for Open Panels/Affordances and Architectures: A Materialist Approach to Digital Design

Open Panel

9:00 to 10:30 am

ICC: C2.1

The design of technological objects and systems cannot be separated from the social structures within which they arise and operate. People and things are mutually influential and co-constitutive. This simple idea—that people shape technologies and technologies shape people—undergirds recent advancements in affordance theory and platform/infrastructure studies. Across disciplines, scholars are developing precise language and robust frameworks for understanding how social dynamics are built into socio-technical systems and how socio-technical systems structure social dynamics. These theoretical advancements arise through and alongside critical work on digitization and automation as an integral component of personal and public life (see especially Nagy and Neff 2015; Plantin et al. 2016; Davis and Chouinard 2017; and Evans et al. 2017). This panel seeks to implement, build on, and apply clear conceptualizations of "affordance" to better understand how the architectures of digital platforms and infrastructures take shape and exert force. An affordance perspective on digital architectures fosters questions about the social antecedents to design decisions as well as questions about social and institutional effects. For instance, what is the interplay between administrative medical interfaces and physician-patient relations? How do dating apps with "swipe" functions (re)formulate intimacy and courtship rituals? What agendas are embedded in digital maps, and how do these mappings inform experiences of space and place? How do vote-based visibility algorithms encourage or discourage dissent? We seek to strengthen a theoretical orientation towards the materialist study of digital design through serious treatment of technological affordances.

Participants:

Affective Affordances in Multisensory Computing *Erika Kerruish, Southern Cross University*

This paper develops the idea of affective affordances in the context of multisensory computing. A number of devices incorporating touch, taste and smell into Human Computer Interfaces (HCI) will be examined (eg, Orbrist et al. 2017; Ranasinghe et al. 2017; Wada and Shibata 2007). Interaction with these devices is considered in terms of perceptual circuits, as discussed in postphenomenological research (Hoel and Carusi 2015; 2016). The social and cultural as well as the material is included in perceptual circuits via the participation of data, computation, things, habits, symbols and tools. The affective character and intensity of multisensory devices may vary with individual and group histories and embodied practices (Hasse 2013; Yan et al. 2015). An affective affordance is the emotional opportunity a device presents to a user (rather than an action possibility). It is a perceived affordance in Don Norman's terms (1999), however, the symbolically and technologically distributed body of postphenomenological research prevents a clear distinction being made between perceiver and device. This paper seeks to extend research in postphenomenology by exploring multisensory devices' mediation of experience, as well as improve

understanding of the diverse embodiment of computer users.

A Theatre of Digital Designing *Allen Higgins, University College Dublin, Ireland*

Design thinking and digital designing are intangible process yet industry and others aspire to implement, supervise and control them. The data for this paper derives from a long-duration workplace ethnography of digital production carried out by the author employing a grounded analysis of interviews, reflections and recordings from episodic design interactions. The leitmotif of 'theatre' for digital designing, software engineering, and collaborative designing, is used to frame interpersonal enactment: episodes of exposition, performing, articulating, negotiating, explaining; involving the writer, other actors, and audience. Analysis and interpretation of design action draws upon four theatre/drama movements: Konstantin Stanislavski's realism; Bertolt Brecht's Epic theatre; Antonin Artaud's Theatre of Cruelty and Absurdist theatre; and contemporary notions of audience participation Translating from theatre to collaborative designing shifts attention towards transitory ephemeral aspects of organisational life. The virtual, intangible, thoughtful domain of software design is represented as a social, performative and negotiated process. Theatrical designing occurs in moments of learning, experimenting, exploring, acting and playing out product designs; through interactions with others, interacting with objects, etcetera. Drama theories suggest counterintuitive ways of accounting for and responding to the 'apparitions' of designing: misunderstandings, bugs, breakdowns, and failures. Designing as theatre exposes modes of being, purpose, identities, politics and more. These are new, promising avenues for theorising how the action of empirical designing unfolds, with implications for how it can be performed differently.

Consolidating Database of Digitalising Healthcare Service *Zheng Li, NAIS, CAST; Xinqing Zhang, Peking Union Medical College; Shanshan Mei, Xi'an Medical University; Hui Luo, National Academy of Innovation Strategy, CAST; Zhengfeng Li, School of Social Sciences, Tsinghua University*

STS researchers may sensitively smell that behind today's encouraging achievements of new technologies in the emerging digitalising world, challenge of a more imbalanced and insufficient development of peoples and societies would be greater and more urgent. To design a better affordance of digital interface between, for example, healthcare administration and physician-patient relations, consolidating database of healthcare cases is vitally important because interaction between digital product/service and their customer is fundamentally determined by data collection and management. This paper presented database building of cases about conflicts between patients and doctors/nurses. The reports from public media platforms in China from 2013 to 2017 were selected. Using method of Qualitative Data Analysis and software NVivo, 228 texts were structured into qualitative data meanwhile the conflict cases happened in the 204 healthcare organisations were analysed in the aspects of location, time, means and motivation. Based on this solid, extensible database, a framework of technological affordance was reflected and concluded for designing a

better digitalising healthcare service. Four pragmatic suggestions in terms of medical treatment, hospital administration, patient communication, and relevant laws and policies were presented. This brand-new study could be valuable for the development of digital product and service in the reform and promotion of China healthcare system, and could also be a useful, transnational reference for the world digitalising healthcare practice and research.

Digital work practices: affordances in design education *Cathy Lockhart, University of Technology Sydney; Thomas Lee, University of Technology Sydney; Alexandra Crosby, University of Technology Sydney; Fiona Peterson, RMIT*

This paper draws from a multi-disciplinary, multi-institutional research project on digital work practices and graduate work readiness. Utilising the concept of affordances (Evans et al. 2017), we focus on the potential for domain-specific learning experiences within design education. This paper argues thinking through affordances can be useful when considered from the perspective of disciplinary practices (such as drawing in product design) and applied to specific technologies (such as collaborative online platforms). For the purpose of this project, we have articulated digital capabilities by categorising affordances in terms of three levels of complexity for scaffolded learning (Best 2009). In our consideration if interdisciplinary design education we build on Best's classification by adding the fourth level 'emergent affordances': Emergent affordances enable the user to imagine future uses of technological tools and spaces, and can emerge during the design of future scenarios. In this paper we focus on the application of these digital capabilities to the domain of collaboration, and make visible some of the gaps between student experience and industry expectations of digital affordances. In order to further develop the relationship between technological affordances and design education, we analyse multiple data sets including a design industry round table and the results of an innovation in a design studio subject at the University of Technology Sydney. Best, K. (2009). Invalid command: Affordances, ICTs and user control. Information, Communication & Society, 12(7), 1015-1040. Evans, S. K., Pearce, K. E., Vitak, J., & Treem, J. W. (2017). Explicating affordances: A conceptual framework for understanding affordances in communication research. Journal of Computer-Mediated Communication, 22, 35–52.

Doing Time in the Home-Space: Tamper Proof Ankle Monitors, Affordances and Anticipatory Methodology *Suneel Jethani, University of Melbourne*

In designing wearable electronic monitoring technology, compliance overshadows other aspects of a given design strategy and narrow the aesthetic, ergonomic and functional potentialities of a device. The assumption within the so-called "human-centered design" approach to is that through empathy building, observation, and a cursory form of ethnography that designers, of products and services, become authorities on the look and feel of technical objects and how they should be ideally used. In order to address some of the biases arising out of narrow constructions of those subjected to house arrest and those who monitor and police them the unexpected and non-standard ways in which electronic monitoring devices are embodied needs to become a priority in a range of scholarly disciplines in concert with various areas of

design and production. In this paper, I engage with emerging critiques of wearable devices and argue that: (1) wearable technology is particularly sensitive to the effects of semantic framing based on life-world emplacement and location a device is worn on the body; (2) these framings and classifications present the challenge of ethical interpretation to designers and researchers seeking to better understand the scope of wearable self-tracking technology, and (3) a notion of anticipation that is grounded in materiality and the lateral flow of affordance between different classes of wearable devices offers a heuristics through which deeper and more critical understandings could be established and exchanged between researchers and designers.

Session Organizers:
  Jenny L Davis, The Australian National University
  Timothy Graham, Australian National University
  Baptiste Brossard, The Australian National University
Chair:
  Jenny L Davis, The Australian National University

154. Science and Activism: Medical Approaches
Papers for Open Panels/Science and Activism: Trans-Disciplinary STS Approaches
Open Panel
9:00 to 10:30 am
ICC: C2.2

Science and activism have multifaceted, challenging and often controversial interactions. Within scientific disciplines, activism may play out in cultural upheavals, destabilized conditions of knowledge production, contested funding regimes, and democratization of processes or outcomes. Alternative narratives, diverse methodologies, and public debates may underpin struggles for increased transparency in science and preservation of a meaningful, critical role for science institutions. Interventions from outside the discipline may include critique, dissent, protest, threats or total disruption. By opening up the politics of representation, sense making and engagement in relation to science, activism potentially plays a catalytic role in the STS quest for justice and social transformation. The aim of this panel is to examine the intersections of science and activism, to offer new perspectives on science agendas, interests, policies and practices, and to foster mutual knowledge exchanges. The following questions are suggested as possible avenues for exploration: How do science and activism intersect, challenge, transgress and dismantle particular valuing systems to engender social change? What kinds of trans-disciplinary STS justice perspectives advance our understanding of the politics of science? How can the politics of scientific representation be reconfigured – in other words, how are authority, expertise, interests, and media implicated in public controversies and transformations? In what ways do scientific and activist popularization strategies open up and close down opportunities for interventions, mutual exchange, and engagement? Contributions that explore trans-disciplinary possibilities for new modes of thinking and action are particularly welcome but not the sole focus of the panel.

Participants:
  Democratising Science By Removing Secrecy *Alice Williamson, The University of Sydney*
  Open Source Malaria (OSM) is an international consortium of drug discovery researchers with a difference: radical transparency. Guided by The Six Laws of Open Science, OSM publishes all of its data in real-time on the internet for anyone to see, and will not patent

any of its research. The aim is to find a new medicine for malaria – a disease that killed 445 000 people in 2016 – as quickly and cheaply as possible. OSM has created a blueprint for open source drug discovery and aims to prove that research is more productive when ideas and critiques shared. OSM moves beyond traditional research practice and seeks to change existing models of drug discovery to improve access to essential medicines This paper will examine open science as a form of activism by TRANSdisciplinary and cross-border practitioners. Removing secrecy from science is a key step in democratisation of the discipline. When scientific processes are transparent, and both successes and failures shared, the public are empowered.

Biology as an insider science: Sexual minorities and the genetics of sexual orientation. *Guaspare-Cartron Catherine, CNRS, UMI Epidapo*

Our talk will examine the intersections of science and activism through the case of biology of sexual orientation. Some studies have stressed that some of the most renowned scientists in the field, mostly developed in the US and the UK, are openly members of the LGB community. Despite the traditional norms of neutrality and impartiality that are supposed to prevail in science, these scientists chose to self-disclose repeatedly and publicly one of their most personal feature, their sexual orientation. One example among many others, Dean Hamer, in 2004, chief of the gene structure and regulation section at the US National Cancer Institute, announce in the New York Times his same sex marriage while recalling that "he published evidence suggesting a genetic predisposition for male homosexuality". Moreover, it is quite often that these famous researchers mobilize in the public debate their scientific knowledge to support the extension of sociopolitical rights of sexual minorities and to weight on public policies. In our presentation, we will address a set of questions, in particular why did scientists chose through the practice of self-disclosing to personalize their scientific authorship? Are LGB values, interests and funds shaping, directly or indirectly, their research program? We will check also whether through the dual process of personalization and advocacy, scientists aim not only to support a minority political agenda, but more deeply to build biology of sexual orientation as an "insider science" that could be more easily embraced by the LGB community than any other possible preexisting "outsider" science.

Getting Under Your Skin: The Science of Implicit Bias on Screen *Beck Wise, University of New England, Australia*
Implicit bias has emerged as a keyword in public debates about racial and gender justice in recent years, part of a larger movement legal scholar Jonathan Kahn calls "recreational antiracism": a push to frame antiracism in terms of diversity, and to place responsibility for equity on individuals rather than institutions, such as universities and corporations which offer anti-bias workshops for employees while failing to address structural barriers to access. "Bias" offers a palatable alternative to confronting terms like "racism" for activists and other rhetors, naturalising past acts of discrimination while offering hope for a post-bias future: what science can name, science can cure. In this paper, I examine the scientistic visual rhetoric of the anti-bias public service advertisement campaign Love Has No Labels, and its use

of emotional and scientific appeals to alert viewers to their own biases. In this campaign, x-ray figures are shown dancing on a screen in a public square, before people step out from behind the screen to reveal interracial, inter-ability, or same-sex pairings. In other words, (virtual) medical visualization is said to reveal the essential falseness of bodily difference by demonstrating that we are all the same under the skin, analogizing across categories of bodily difference and privileging—quite literally—the most superficial notions of diversity. My paper examines the rhetorical implications and social stakes of such appeals to scientific authority in public culture and debate, and offers a framework for assessing the efficacy of those appeals in promoting social justice through popular texts.

Session Organizer:
Alice Williamson, The University of Sydney

155. Fleck Book Prize for "Breathing Race into the Machine" by Lundy Braun: Author Meets Critic
Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: C2.3
This panel will discuss Lundy Braun's Breathing Race into the Machine: The Surprising Career of the Spirometer from Plantation to Genetics (Minnesota, 2014), the winner of the 2018 Fleck Prize.
Participants:
Melissa Creary *Melissa Creary, University of Michigan, School of Public Health*
n/a
Emma Kowal *Emma Kowal, Deakin University*
n/a
Hans Pols *Hans Pols, University of Sydney*
n/a
Suman Seth *Suman Seth, Cornell University*
n/a
Session Organizer:
Shobita Parthasarathy, University of Michigan
Chair:
Daniel Breslau, Virginia Tech

156. Indigenous Knowledges and Technologies 1
Papers for Open Panels/Indigenous Knowledges and Technologies
Open Panel
9:00 to 10:30 am
ICC: C2.4
Indigenous knowledges and technologies, i.e. knowledge and artefacts produced by native people from around the world, such as Amerindians, Aboriginal Australians, and so on, are a marginal topic in STS. Few studies, articles, and books have been published on the topic in spite of the array of experiences and approaches from other fields such as media studies, anthropology, telecommunications, human rights, to mention a few. About the late 1980s and early 1990s there was a turn in STS towards the science-policy interface, which resulted in local knowledges and expertises becoming an emerging topic in the area. Nowadays, citizen and open science are popular research topics and receive growing attention from STS scholars. However, indigenous knowledges and technologies remain a marginal topic in the field. STS appears to still be in need of a process of decolonisation as to a large extent it is still insensible to knowledges, technologies, practices and epistemologies that have arisen from indigenous people around the globe. This panel seeks to bring together

researchers interested in a range of topics related to indigenous knowledges and technologies, including, but not restricted to: a) the appropriation of Indigenous knowledges and technologies; b) Indigenous knowledges and technological policymaking; c) Uses and developments of information and communication technologies (ICT) by indigenous peoples; d) Decolonial and Postcolonial indigenous STS; e) Clashing ontologies between indigenous and modern societies; f) indigenous knowledges and sustainable community development

Participants:

Accounting for effective Yol\u Ranger work: emergent criteria from the evolution of 'both-ways' knowledge practices *Margaret Leanne Ayre, The University of Melbourne; Jonathan Wearne, Dhimurru Aboriginal Corporation; Djalinda Yunupingu, Dhimurru Aboriginal Corporation; Greg Wearne, Wearne Advisors; Cheryl O'Dwyer, Batchelor Institute of Indigenous Tertiary Education*

This paper provides insights on Indigenous (Australian Aboriginal) Ranger work from the knowledge community of an Aboriginal (Yolngu) land/sea management organisation in North-east Arnhem Land, Northern Territory: the Dhimurru Aboriginal Corporation ('Dhimurru'). It is based on the doctoral studies of one researcher from 1995-2002 (Ayre and Verran 2010) and on collaborative research in 2016/17 with members of the Dhimurru and Batchelor Institute involving 35 interviews, participant observation and two focus groups. We understand Yolngu Ranger work at Dhimurru as 'knowledge work' and take inspiration from science studies scholars, Shapin and Schaffer (1985), who understand knowledge as emergent in heterogenous 'technologies of knowledge production', or what we call here, 'knowledge practices'. In Dhimurru's early days, Yol\u Ranger work was focussed on combining knowledge practices of Yolngu and non-Yolngu (western scientific) land and sea management. This emergent set of 'both-ways', mutually translating knowledge practices are: 'Djalkiri (Journeying)-Waanga (Place Naming)-Dhaawu (Storying and Tracing)'. More recently, these practices have been extended to include practices of 'Being Ralpa' (Being Disciplined/Proud) and 'Mobilising-the-Dhimurru Vision Statement'. This paper describes how this evolution of knowledge practices has emerged in response to Australian Government (AG) and other 'mainstream' accountabilities of Indigenous NRM as well as Yol\u expectations of effective ranger work. We argue that the practices we describe represent epistemic criteria (Addelson 1994) for Yolngu Ranger work. These are accounted for in Dhimurru's 'both-ways' knowledge community through the government-accredited Dhimurru Indigenous Protected Area Plan of Management (2015-2022) and emergent Yolngu traditions of land and sea management such as the galtha rom methodology (Marika, Ngurruwuthun et al. 1989, Marika-Mununggiritj 1990). Such generative criteria should be formally recognised in co-benefit frameworks (Barber and Jackson 2017) for Indigenous NRM to capture the true contribution of this work to environmental, social and economic outcomes.

References: Addelson, K. P. (1994). Moral Passages: Toward a Collectivist Moral Theory. New York, Routledge. Barber, M. and S. Jackson (2017). "Identifying and categorizing cobenefits in state-supported Australian indigenous environmental management programs: international research implications." Ecology and Society 22(2). Marika-Mununggiritj, R. (1990). "Workshops as teaching learning environments." Ngoonjook(4): 43. Marika, R., et al. (1989). Always Together, Yaka Gana: Participatory Research at Yirrkala As Part of the Development of a Yolngu Education. Participatory Research Conference. Calgary. Shapin, S. and S. Schaffer (1985). Leviathan and the Air Pump: Hobbes, Boyle and the Experimental Life. Princeton., Princeton University Press.

Doing the work of 'working together': collaboratively enacting Indigenous land management in central Australia *Jennifer Macdonald, Charles Darwin University; Beau Austin, Charles Darwin University*

This paper begins with a story of mutual misunderstanding and disconcertment which arose during a conversation between senior Anangu (Indigenous people of the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands in South Australia) and Piranpa (non-Anangu) land managers about what does, and does not constitute land management work. The story comes from my experience as a research student living in the APY Lands for six months in 2014 and 2015. During this time I developed relationships with Anangu Traditional Owners, learnt cursory Pitjantjatjara (language) and worked with APY Land Management to develop discussions and understandings about Anangu ways of measuring effectiveness in land management. The story points to an interesting moment in the everyday practice of collaborative Indigenous land management, with this moment exemplary of many such moments that arise when working with different ways of knowing and doing 'country' and 'management'. For both the Anangu women and the Piranpa land manager, collaborative land management includes relations of authority, remuneration, and responsibility. By detailing this empirical work we hope to strengthen intercultural land management. The story highlights the complexity of 'going on together' with different knowledges, practices and beliefs. Our differences provide a constant site of tension, which cannot simply be 'resolved' through the rigid application of protocols, guidelines and principles. Rather, sensitivity, good faith and skilled practice is required to collaboratively enact Country.

Rethinking sustainability: towards an Indigenous-led approach to sustainable community development *Marisol Campos-Navarrete, Trent University; Asaf Zohar, Trent University*

This study explores the nature of meaningful collaboration between indigenous peoples and western society in the pursuit of what it is termed 'sustainable community development' in the mainstream discourse. It aims to identify successful organizing structures and processes that promote innovation and co-creation in collaborative initiatives involving Indigenous communities. Western approaches to sustainable community development, grounded in the notion of increasing community well-being along social, cultural, economic, and environmental dimensions, often serve to marginalize and alienate indigenous ways of knowing. Based on the findings of a case study of a science and green technology Innovation Park undertaken in Ontario, Canada, we argue that dialogic collaboration grounded in these western perspectives on sustainable development can potentially dilute and often silence Indigenous

Knowledges perspectives help by local indigenous communities. The findings suggest that at the core level of project vision and values, a 'non- negotiated primacy' should be given to local indigenous ways of knowing in shaping and defining the meaning and direction of sustainable community development. Instead of trying to 'bridge' the space between the Indigenous and Western thought worlds, a 'primacy' approach advocates for an indigenous peoples-led definition of project vision and values in order to ground the collaborative project in local indigenous ways of knowing, values and beliefs. Once this point of departure is established, successful innovative co-creation and collaboration occur most frequently at the inter-personal level of ongoing project design and implementation. This interpersonal capacity can be described as the ability to collaboratively negotiate and resolve inherent points of difference and diversity between communities. We conclude with a reflection on how these new understandings can potentially generate innovative directions for a locally rooted, Indigenous-led approach to 'sustainable community development'.

Storying The Past: Archeology in Ontario after the Truth and Reconciliation Commission *Nicholas van Beek, Trent University*

This study examines the practices and usages of archeological knowledge production in the province of Ontario, Canada and explores opportunities for a more collaborative and an ultimately indigenized approach. It aims to help chart a way forward through a relationship shaped by a provincial legal and policy framework, which has been publicly characterized by archeologists and Indigenous actors alike as defective and in need of reform. The Truth and Reconciliation Commissions call to action #79 calling for revisions to commemorative practices and to "integrate Indigenous history, heritage values, and memory practices" into heritage work is the framework through which I identify contemporary colonial power structures and epistemologies currently at work in the creation and representations of archeological and historical knowledges in Ontario. The historic site of Sainte-Marie among the Hurons is explored as a commemorative site in Ontario with a long history of flawed archeological and commemorative practices. This has led to a historical representation steeped in colonialism, which is deeply in need of reform. Additionally, I identify best practices for archeological knowledge creation through the exploration of case studies such as the work of archeologist Alisha Gauvreau whose work on Triquet Island in British Columbia integrated local oral histories into archeological projects. The integration of Indigenous practices ultimately enriched understandings of coastal habitation during the glacial period and provides a framework for initiating future research around Canada and abroad. I argue for the de-centering of settler concepts of time, language and knowledge production while centering Indigenous knowledges, including Ojibway concepts such as gikinawaabi (passing of knowledge through experience from elders to younger generations) and re-imagining archeology as a method of community storytelling.

The revitalization of a shamanic land ethic *Daniel G. Cooper, University of Oxford*

Within the contested circum-Mount Roraima landscape— a highland region of northern Amazonia that transcends

Guyana, Brazil, and Venezuela—the piyai'san (shaman), kanaimɨ (sorcerer), and pukena' (wisdom possessor/prophet leader of the Alleluia syncretic revitalization movement) are indigenous shamanic practitioners who interpret and maintain strict social and environmental ethics. Just as there are three principal shamanic agents within the tripartite circum-Roraima landscape, and three distinct worlds within a shamanic conceptual system (above, middle, and under), there are also three fundamental principles within a shamanic land ethic: interconnectivity, reciprocity, and hierarchy. Each manifests in etrakuasoman, an Akawaio "way of life" known as mayu' in Makushi; marshruman in Arawak; "self-help" in Creole English; a.k.a. community work. This ancient tradition intimately associated with land modification—especially the rotational slash and burn cultivation of cassava—necessitates cooperation and exchange between diverse spiritual, ecological, and political constituents. Indigenous knowledge and technology are increasingly seen as valuable resources to be integrated with modern science, technology, and innovation to address contemporary conservation and development challenges. After a review of the literature on indigenous knowledge and spiritual ecology, this paper draws from data gathered during ethnographic doctoral fieldwork in the circum-Roraima landscape from 2011-2013 in order to outline a shamanic land ethic. It concludes with a discussion of ways to apply this ethic to diverse research methodologies and fields including political ecology, natural and cultural resource management, and ethnodevelopment.

Eeyou Communication Network And Tshiuetin Rail *Tricia A. Toso, Concordia University*

Infrastructure implementation and maintenance has been an effective instrument in the colonization and perpetuation of inequalities for Indigenous peoples in Canada. As symbols of state-making (Larkin 2013) and the means of funnelling natural resources and wealth to the settler-colonial state and citizens, infrastructure has been an effective instrument in colonization and dispossessing Indigenous peoples of their land and autonomy (Graham and Marvin 2001; Peters 2005; Rangan and Lane 2001). Indigenous communities, particularly in the Canada's North, have been vastly underserved by telecommunications, water, and transportation infrastructure providers. In response, many First Nations communities are developing and implementing their own infrastructural systems that work to meet their communities' needs, while navigating settler government laws and regulations. Focusing on a not-for-profit telecommunications corporation in Eeyou Istchee and municipalities of the James Bay region, and the Tshiuetin Rail Transportation run by Innu Takuaikan Uashat Mak Mani-Utenam, Naskapi Nation of Kawawachikamach and Nation Innu Matimekush-Lac John, I consider the challenges and successes of these infrastructures. As material things and constellations of social relations (Carse 2017), sociotechnical systems have organizational, economic, legal, scientific, and resource demands that are regulated and employed by competing interests and capacities. The Eeyou Communications Network and the Tshiuetin Railway draw attention to infrastructural disparities in Canada and the ways in which state legislature and corporate interests often

function to hinder the development alternative modes or models of infrastructure provision. This paper, "Eeyou Communications Network and Tshiuetin Rail" considers the ways in which these infrastructures emerge as "indefinite set[s] of distributed interactions over extended periods of time" (Harvey, Jensen & Morita 2017, 10) and in dynamic, and often unexpected, interactions bio-cultural worlds (Lea 2017).

Session Organizer:
Tiago Ribeiro Duarte, University of Brasília

Chair:
Claudia Magallanes-Blanco, UNIVERSIDAD IBEROAMERICANA PUEBLA

157. Being Religious, Being Scientific: The Dynamics Of Science And Religion In The Laboratory
Papers for Open Panels/Being religious, being scientific: the dynamics of science and religion in the laboratory
Open Panel
9:00 to 10:30 am
ICC: C2.5

While popular imagination of the relation between science and religion continues to be dominated by either "conflict thesis" or "complementarity thesis", emerging scholarship in the social studies of science has brought to light the many ways in which science and religion interact. Anthropological studies have challenged the assumption that scientists should necessarily be atheists. Today, world religions and science co-exist in ways that have not been explored widely in the literature e.g. Jewish rabbis and scientists together determine what foods are kosher (ritually "pure"), and laboratories in India routinely launch research projects with a puja (ritual offering) to Hindu deities. In this panel, we discuss how science shapes, and is shaped by, religious beliefs, in an age of transnational ecological challenges, political upheaval and socio-economic turmoil. This panel would explore questions like: How do scientists negotiate their religious beliefs with their scientific careers (and vice versa)? How do the products of scientific research transform the religious beliefs of consumers? What are the consequences of religious ethics (and atheistic ideas) for developing research projects? What role do national governments play in designing science policy that (does not) supports dominant religious doctrines? What influences do religious leaders and organizations have on science? What are the social implications of these factors for scientific practice and religious beliefs?

Participants:

Desecularization of Activities of Muslim Scientists as a STS-oriented Coexistence of Islam and Science *Najmoddin Yazdi, The research Institute for Science, Technology and Industry Policy (RISTIP); Sharif University of Te; Ali Maleki, The research Institute for Science, Technology and Industry Policy (RISTIP); Sharif University of Te*

Despite the long-running academic assumption that science and religion are necessarily in epistemological conflict over competing truth claims, various coexistence possibilities have been theorized during the last decades, notably the social and historical construction of science. But, STS scholarship has not yet penetrated much into the study of this relationship. This paper tries to normatively open up incorporation of STS field to the coexistence problem of science and Islam. Distinct from usual sociological or empirical works which are based on empiricism and geared to the norms of science and the subfield of sociology, this paper adopts an Intra-Islam

standing to help Islamic scientists address one of their increasing needs, namely desecularization of daily scientific activities, based on the lived experience of the authors and also continuing discussions with colleagues. In fact, it attempts to ignite an alternative to Islamicization (desecularization) of science by normatively depicting socio-cultural processes of knowledge production within Islamic scientific society based on Islam basics rather than an Islamic interpretation of existing scientific knowledge. Normativity, individuality and process-orientedness are three odd features of the research arisen out of the intra-Islam paradigm. By lived experience, the results show that such desecularization could happen at three levels in a Islamic scientist, namely 1) interweaving basics of Islam into daily activities of scientific society and the process of knowledge production as the soul and compass of individual thinking, 2) ethics, and 3) shaping a discourse on the first two to build up a new demanding Islamic social-institutional arrangement.

Negotiating the boundary between science and religion in modern rational institutions *Pia Vuolanto, University of Tampere Research Centre for Knowledge, Science, Technology and Innovation Studies; Ali Qadir, University of Tampere, Finland; Tatiana Tiaynen-Qadir, University of Tampere, Finland*

What are the various strategies by which religiously or spiritually oriented people negotiate the boundary between science and religion in modern life in and around diverse rational institutions? We seek to unpack how this everyday boundary work takes place and what happens to human experiences of the Divine in institutions such as courts, parliaments, schools, universities and health clinics and so on. We will present preliminary findings from our pilot project in Finland and Sweden. We are in the process of collecting ethnographic research material from health clinics and universities. The material includes informal talking, participation in formal and informal gatherings, rituals and group discussions, and interviewing. Our interlocutors are actors in modern institutions while they simultaneously actively participate in Orthodox, Lutheran or Muslim parishes and religious communities. Our first findings with medical practitioners show that the interlocutors are 'boundary agents' in the sense that they balance between scientific and religious worldview(s) and make interconnections between different health care systems and institutions. The paper will present broad categories of practices by such boundary agents based on our preliminary fieldwork and early analysis.

For The Greater Glory Of God – Jesuits And The Debate On Genetically Modified Food Crops *Joseph Satish, University of Hyderabad, India*

The issue of genetically modified (GM) food crops continues to be a global controversy. Proponents argue that GM crops ensure food security, higher crop yields and better economic returns. Critics submit that the long-term effects on health and biodiversity are unclear, and that farmers gain little from GM crops. The debate is often reduced to a dichotomy between "(scientific) facts" and "(socio-environmental) values"; but the cultural, political and religious preferences of scientists, farmers and consumers are not so easily demarcated. This paper is an exploration into the science-religion dimension of the

GM food debate. I examine a 2003 discussion between nine Jesuit priests – members of a religious order in the Catholic Church – who also happen to be "experts" in botany, biotechnology and agriculture. Published in Promotio Iustitiae (the magazine of the Social Justice Secretariat of the Jesuits) the priests debated if GM food technology could be considered safe and ethical. This discussion, occurring in the context of Jesuits' global mission for social justice, offers a fresh perspective for STS research as these Jesuits are not only trained in Catholic theology and philosophy but also acknowledged as experts in their respective disciplines and countries. Using thematic analysis, this paper explores the tensions between the missionary goals of the Jesuits and their response to the techno-scientific realities of agriculture in their missionary stations. Subsequently, the paper attempts to identify themes in the Jesuits' engagement with the GM food crop debate and examines if this Jesuit discussion offers any scope to bring the debate to a satisfactory resolution.

Science, State, and Spirituality: Scientific Creationism in South Korea *Hyung Wook Park, Nanyang Technological University*
This paper aims at describing how scientific creationism has become a major social and religious movement in South Korea. As Ronald Numbers has shown, South Korea, since 1980, has become "the creationist capital of the world, in density, if not in influence." Borrowing the sociological and historical literature on developmental state and the post-Westphalian religions, I argue that the rise of creationism in Korea reflected a number of scientists' pursuit of their own desire – rather than that of the state and the dictator - in the age of globalization and post-developmental state. I will show how creationism offered them a means to depart from both religion and science constructed within the constraints of Korea's developmental state, which had been formed as a consequence of its colonial and postcolonial experiences during the twentieth century. In creationism, the early members of the Korean Association for Creation Research (KACR) found a good means to overcome their lower cultural status in the country with a strong Confucian legacy, and to become conservative intellectuals in their local church communities, which in turn provided a novel venue for their international relations in the global creationist movement. To female members of KACR, creationism also gave an opportunity to grapple with the gendered discourses and practices in both churches and academia, which reflected the contours of the South Korean developmental state that was implementing its "militarized modernity," as Seungsook Moon has called. In explicating these issues, I utilize the Canadian sociologist Peter Beyer's theory of "post-Westphalian religions," which successfully accounts for how religions transformed themselves in contemporary society by severing their ties to the states that patronized them in the "Westphalian condition." According to Beyer, modern religions have now become transnational with the power of mass media, new entertainment, and global capitalism. With this theory, my paper will explain why it has been so hard to dismantle science creationism, which has become a new post-Westphalian religion that can overcome Korea's old limitations stemming from the age of its developmental state and colonial past. This paper's methodology is a critical analysis of creationists' writings

and speeches - especially their public confession of faith, called "kanchung" - as well a series of structured interviews of major leaders of KACR.

The Invention of Halal Stunning: A Techno-Moral History of Redefining Animal Welfare and Islamic Practices in the Laboratory *En-Chieh Chao, National Sun Yat-sen University*
This essay explores the ways in which halal meat is produced through a network of techno-moral discourses, scientific experiments, and non-human actors. The case examined here is the invention of "halal stunning." In this case, to redraw the boundaries of halalness involves debates around "humane slaughter," the construction of "reversible stunning," as well as the cooperation between religious scholars and animal scientists. In order to highlight the timeliness of the issue, this paper starts with the recent global controversy of religious slaughter, describing the ways in which specific animal welfare groups, media, politicians, and governments have come to construct the false opposition between "animal rights" and "freedom of religion," and between science and religion. Such a perspective, I argue, underestimates the degrees to which religion and science are compatible and ignores the fact that they have long closely worked together. Through the idea of "co-production" (Jasanoff, 2004) and "the enacted actors" (Law and Mol, 2008), I describe a phenomenon in which Islamic decrees promote scientific practices, and technologies also reconstitute the content of what is considered halal. By seeing laboratory as a boundary object (Star 2010), this article narrates a techno-moral history in which laboratory connects meat scientists, animal welfare activists, international trade agents, religious scholars, and reactive animals, finally materializing "halal stunning" in New Zealand and successfully being accepted by Muslim-majority countries. This case study helps deepen our understandings of the complexity of food ethics in the contemporary world, and broadens the field of religion, science and technology.

Session Organizer:
Joseph Satish, University of Hyderabad, India
Discussant:
Doru Costache, Sydney College of Divinity

158. Travelling Knowledge (I): Concepts, Practices and Institutions
Papers for Open Panels/Travelling knowledge: theories, methods and empirical research made in circulation
Open Panel
9:00 to 10:30 am
ICC: C2.6

Despite opposite forces recently observed, globalization still seems to be a driving force for much of current trends in science and technology. The increase of internationalization of scientific and technological practices, from faculty/student mobility to co-authorship of articles, is an indicator of a process that still needs further understanding. In this panel, we want to explore in depth how the circulation of knowledge between different spaces of production transform such knowledge, the actors involved, the procedures through which it travels and the means of diffusing the outcome of research. In particular, his panel shows how practices of knowledge production, institutions (from universities to scholarship programs) and concepts have played a fundamental role in knowledge circulation.
Participants:

Millenarian Metropoles: Science, Empire, and the Production of Novelty in Contemporary Liberalism *Aaron Neiman, Stanford University*

In the classical conception of empire, a basic spatial distinction maintains the global imbalance of power: the metropole, referring to administrative and commercial urban centers, and the periphery- spaces of dependence characterized by their subordination to the core. Scholarship across many disciplines has complicated this narrative, noting the ways in which these two spaces co-construct, subvert, and blur one another through the global flow of commodities and knowledge. In particular, there now exists a rich body of literature exploring the production of scientific knowledge throughout the Global South- former peripheries turned sites of modernity and progress. In this paper, I call attention back to the metropoles, now home to research institutions of unparalleled global prestige that serve not only to produce knowledge, but novelty. I argue that these sites- Silicon Valley, London, Paris, and Boston, among others- act as top-down nodes in the global scientific network, conceiving massive "disruptive" technological undertakings that promise to solve humanity's most urgent problems. These enterprises, which include automation, precision medicine, artificial intelligence, and renewable energy, set the global agenda for science as a righteous, millenarian, and salvational force in the world. I argue that the evermore promissory and ambitious nature of the projects that flow outward from the world's scientific metropoles serve to rehabilitate imperial power and protect the authority of liberal scientism.

Naming Institution After Neologism As Marker Of The Institutionalization Of New Discipline. *Philippe GORRY, University of Bordeaux*

The rise of scientific disciplines is synonymous with the emergence of "scientific communities". Divisions between them reflect differences between objects, theories, methods and terminologies (Stichweh, 1992). This dynamism implies "boundary work" (Gieryn, 1995) toward empowerment of new discipline or institutionalization (Huntington, 1968). The role of specific terms in the construction of new research field was examined by Balmer and Sharp (1993) and the institutionalization of terminology is important for the stabilization of new discipline (Hedgecoe, 2003). Scientists construct knowledge through term formation, and used them as rhetorical device, especially at a time of new field's emergence (Pecman, 2014). Nowadays, science is producing new words or neologisms ad libitum (Fernandez-Silva, 2016). However, neologisms used have attracted little attention among Science and Technology Studies scholars. Studies of new concepts, indicated us new trends on naming institutions with neologisms. We can postulate that neologisms are markers of knowledge production and dissemination, and naming institution after neologisms could be part of a legitimation process. The aim of this empirical contribution is to explore this hypothesis by analyzing affiliation addresses in scientific publications at the global level for neologisms such as bioinformatics, interventional radiology, regenerative medicine or synthetic biology. Numerous institutions have entitled departments with neologisms: the observed trends vary according to the neologism, over time, and between country, reflecting differences in

institutionalization or even legitimation strategy failure. Our results highlight the role of social strategies in constructing knowledge. We will discuss if this phenomenon is an institutional practice of field's homogenization (Glynn and Abzug 2002), or a branding strategy used by scientific community competing for resources (Dori, 2013).

On "Arbitrariness" of World University Rankings *Masashi Shirabe, Tokyo Institute of Technology*

An article that appeared in a Japanese financial newspaper IN 2015 might shock a lot of people working in Japanese HEIs. It reported that Japanese government was introducing numerical targets to measure the results of its Fifth Science and Technology Basic Plan, which will form the core of its science and technology policies for the coming five years, and that one of the targets to be adopted will be the global rankings of Japanese universities. The first time global university rankings were adopted as a quantitative target for public policy was in the Japan Revitalization Strategy published in 2013. This strategy included as one of its targets to have "at least 10 [Japanese universities] among the top 100 in the global ranking of universities." Actually, however, there can be seen arbitrariness in all the processes to produce world university rankings. For examples, there could be seen big leaps of Turkish universities in THE's World University Rankings in 2014, and its cause is easily attributed to just two of Higgs boson papers published in 2012. Therefore, ranking agencies had to "improve" their methodologies the next year. From this episode, it is evident that the global rankings of universities, which are subject to big shifts based on the thinking of the ranking agencies, are not something to fret over, nor are they appropriate for adoption as numerical targets. Still many universities cannot neglect such rankings and are struggling to get better scores in such rankings. I will analyze these situations.

International Educational Assessment as a Device for the Circulation of Knowledge and Global Governmentality *Claudio Ramos Zincke; Alejandra Falabella, Universidad Alberto Hurtado*

Since the 1990s, the application of international tests, evaluating the educational performance achieved by the countries, in a comparative perspective, has increased. Behind their production, there is a complex network, in which international organizations such as IEA, OECD, World Bank and Unesco are articulated with state agencies. These international assessments emerged in the late 1960s as a scientific initiative, seeking to "make the world a research laboratory" and have facilitated and promoted hundreds of investigations. This complex network, through which knowledge, data, techniques and normative guidelines circulate, constitutes a governmentality device that governs conducts on a global scale, performing the "educational quality" in the global society. Chile is one of the peripheral countries that were incorporated to these evaluations earlier, in 1967. Since then, it has participated in the regional assessment of Unesco, in OECD's PISA and TALIS, in IEA's TIMSS, CIVED, SITES, ICCS and ICILS. Only between 1997 and 2017, 21 tests have been applied in the country. The operation of this device has led to the insertion of the country's educational system in an international network of knowledge circulation that has had a marked impact on

it: definition of standards, incorporation of new conceptual distinctions, changes in the national evaluation system and the educational curriculum. In the analysis of these processes, scientific-technical reflexivity has prevailed, with little attention to the incidence of the asymmetries of the context in which they take place. The ongoing investigation is based on interviews and the review of documents and press material.

Session Organizer:

Leandro Rodriguez Medina, Universidad de las Americas Puebla

Chair:

Claudio Ramos Zincke

159. E/valuative Actions: Exploring the Doings of E/valuation in Evaluative Systems 1

Papers for Open Panels/E/valuative Actions: Exploring the doings of e/valuation in evaluative systems

Open Panel

9:00 to 10:30 am

ICC: E3.10

New forms of evaluation are reconfiguring professional and organisational life in ways we are only beginning to understand. Not only has the number of evaluations multiplied; multiple evaluative agencies often co-exist. Recent sociological research has therefore emphasised the empirical importance of focusing on the dynamics that occur when activities in an organisation become subject to multiple (sometimes competing) e/valuation registers (Brandtner 2017; Pontikes 2012; Stark 2009). This research also suggests that the plurality of e/valuation registers to which an organisation is subject may actually strengthen the 'resilience' and 'creative potential' of that organisation. In this track, we wish to bring into awareness the multiplicity of e/valuation practices and how these influence organisational practices, including practices of knowledge production and healthcare. Expanding STS insights in the enactment of e/valuation in contemporary society, this track attends to evaluative actions; exploring the 'critical multidimensionality' of how professional work is assessed and configured numerically, verbally and visually through the use of metrics – both by 'outside' actors and practitioners themselves. Metrics allow for experimenting; using performance measurement to enhance healthcare quality, or arranging a more sensitive and nuanced process of intellectual production assessment in which metrics are embedded in wider practices of valuation (de Rijcke et al. 2016, Bal 2017). Yet, e/valuation may also involve strategic ignorance (Pinto 2015, Gross & McGoey 2015); rendering certain aspects invisible, while strengthening others. We are interested in these evaluative actions, and seek to raise questions about their practices and consequences for public and professional life. Questions that may be raised: How to analyse the complex relationship between evaluative knowledges and practices? Which valuation practices and commitments (professional, ethical, material) are we ourselves entangled with in our own work? What 'comfortable' and less fitting subjectivities are interpellated in certain evaluative systems? Whose voice is or becomes legitimate?

Participants:

Chasing Two Hares at Once?: Innovating the Classroom with Datafied Performance *Hanbyul Jeong, KAIST*

Datafication challenges to the long standing trade-off between the scale and efficiency in education. Education technology (EdTech) companies claim that datafication will benefit both students and teachers as data-based personalized or adaptive learning can take care of each student's need and reduce the teachers' workload, thereby improving the quality of education in classrooms of all sizes. Elice, an EdTech startup in South Korea for web-based computer programming platform, shares such vision and aims to provide more accessible and efficient education. Utilizing personal learning data, the platform develops machine learning algorithm that produces a score which indicates the individual student's performance. Some underestimated conflicts over datafication appear when performance becomes an issue of class, rather than that of individual student. In this study, I will unpack the meaning of "performance" in the context of class management by observing how the data practice reshapes the online classes operated in Elice. Evaluation of performance is usually a social problem which requires consensus between appraiser and appraisee, but the datafied performance excludes human intervention on purpose. While engineers are mostly concerned with the type of data (not) collected, modified, and controlled to make algorithm reflect actual performance of each student as much as possible, both teachers and students are expected to form a new rules and relationship at the online class where they are represented only the datafied performance. I will show that, although datafication dreams of innovating classroom, it finally points up traditional dichotomy between scale and efficiency by provoking strategic choices.

Clinical Registries as Strategic Experimenting Artifacts: The Case of 'Top Zorg' in the Netherlands *Jeroen Postma; Iris Wallenburg, institute for Health Policy and Management; Roland Bal, Erasmus university rotterdam*

Clinical registries, as data collecting and performance displaying artifacts, are part of the datafication or 'numbering' trend in healthcare (Essén & Sauder 2016). Through translating clinical work and health outcomes into numbers (e.g. the amount of pressure ulcers on a nursing ward), care practices are rendered commensurable and evaluable, demonstrating (lacking) performance. In this paper, we adopt an experimenting approach to datafication and examine how clinical registries produce new futures for hospital organizations. We build on a national evaluation project on clinical excellence ('TopCare') in the Netherlands, in which three non-university hospitals have obtained a (temporal) subsidy to (further) establish and 'prove' their clinical and research excellence—seeking to acquire a permanent research status and accompanied finance. Drawing on two ethnographic case studies– biobanking for rare lung diseases and the creation of a registry for specialized eye care– we illuminate how registries are employed and visualized to assure impact. We posit registries as strategic experimenting artifacts, tying into the ambitions of both clinical researchers to build international networks for scientific research and publications, and hospital's aims to establish a high-quality reputation, as well as financial stability. Examining the ongoing practices and processes of data collection, categorization, commensuration and singularization, and visualization as mechanisms of valuation (Kornberger 2017), we uncover how hospital organizations seek to display and utilize the added value of their clinical care and research. The research adds to STS insights on quantification and (e)valuation, pointing out how datafication offers new registers for building authority, reputation and knowledge

practices.

Disagreements about benzodiazepine use effects in Uruguay
Nancy Beatriz Calisto, Academic, University of the Republic (Uruguay); Andrea Clara Bielli, Universidad de la República; Santiago Navarro, Universidad de la República, Uruguay; Marcela Jubin, no

This paper analyzes scientific articles and narratives of public health professionals and patients about the use of benzodiazepines (BDZ) in Uruguay, a small Latin American country located between Argentina and Brazil. Contradictory evidence in BDZ consumption practice is identified about the effects of the medication. We noted some conflicts between narratives themselves, between narratives and some scientific articles published in our country and with what is defined by evidence-based policy. Specific disagreements appears in the discourses about expected and no expected effects of use of BDZ what could put in question some implementation policies in public health about these drugs. We analyze specific context factors that could disturb the effectiveness of interventions as they were designed by the policy. We want to discuss this matter to contribute and bring some information about the knowledge gap between care workers, policy makers and patients, specially because Uruguay is not an exception in these consumption practices. The data presented are part of the results of two qualitative researches carried out during four years (from 2013 to 2016) about clinical practice of medicine, psychiatry and psychology in the Uruguayan public health sector. During these years we reviewed national publications about BDZ consumption practices and carried out 35 in-depth interviews to general practitioners, family doctors, psychiatrists and psychologists, 73 in-depth interviews with patients; 2 discussion groups; and 10 interviews with sanitary authorities.

Ecce Homo Academicus: The Revaluation of Higher Education Values *J Britt Holbrook, New Jersey Institute of Technology*

Evaluation can be seen as an opportunity for transvaluation, or what Nietzsche called the revaluation of values. However, evaluation is often treated instead as the enforcement of standards – standardization rather than transformation. When evaluation as transvaluation and evaluation as standardization are both used to evaluate the same subjects, things are working at cross purposes. How can individuals subject to such competing evaluation regimes respond in ways that go beyond mere survival (publish or perish) and instead promote excellence as academic flourishing? This paper recounts – in an autobiographical fashion that brings the issues into sharper relief – various ways (both conceptual and actual) of responding to the challenge. In doing so it outlines a notion of academic flourishing and argues that this ideal, rather than meeting minimum standards, should be used in evaluations for academic advancement (including promotion and tenure). There is, of course, an American flavor to this presentation, and it would be great to see how things are different in other countries!

Session Organizers:
Sarah de Rijcke, Centre for Science and Technology Studies (CWTS)
Iris Wallenburg, institute for Health Policy and Management
Tjitske Holtrop
Roland Bal, Erasmus university rotterdam

Chairs:
Sarah de Rijcke, Centre for Science and Technology Studies (CWTS)
Iris Wallenburg, institute for Health Policy and Management

160. Producing Transformations: Drugs, Bodies, and Experimentation 1
Papers for Open Panels/Producing Transformations: Drugs, bodies, and experimentation
Open Panel
9:00 to 10:30 am
ICC: E3.2

Throughout history, drugs and medications have been used to produce transformations. Experiments with different substances have taken place in diverse contexts: individual, subcultural, communal, scientific, medical, commercial, criminal/illicit and transnational. Despite the immense diversity and heterogeneity of these experiments, each is subject to specific norms, protocols, evaluative criteria, and concerns; and each often entails assembling publics to validate their findings or assess whatever emerges from them. This Open Panel invites papers about the transformations (intended or otherwise) associated with different practices of drug experimentation and consumption. Against commonplace understandings of drugs as stable entities with unique chemical properties that act to produce identifiable effects, the ontological turn in STS inspires a growing number of drug researchers to conceive the action of drugs and their purported effects to be produced in relation to various other actors, arrangements and networks. How do the practical arrangements devised to put drugs to the test in different places and times tally with the historical, cultural, technological and material processes in which drugs are implicated, and which undoubtedly mediate, extend, and complicate their effects? How are those transformations that extend beyond the experimental apparatus accounted for? What gets neglected? What criteria render specific experiments legitimate, and others illicit, and how are these criteria contested, changed, and/or adapted over time? What is unique about the adventures such experimental subjects undertake? What matters to them? What can be learned from situating their activities? How are their findings translated to other situations, and with what implications?

Participants:

Chemical practices: transformation and experimentation as part of LGBTQ Australians' drug consumption *Dean Anthony Murphy, University of Sydney; Kiran Pienaar, Monash University; Kane Race, University of Sydney; Toby Lea, UNSW*

The use of drugs for a wide range of purposes is an increasingly prominent feature of both pharmaceutical markets and lifestyle practices. This trend is particularly evident in sexual and gender minorities where licit and illicit drugs have become key technologies for transforming sexual and gendered experience. However, despite the connections between sexual and gender experimentation, and substance use, much remains unknown about drug consumption among sexual and gender minorities in Australia. Through in-depth, qualitative interviews with LGBTQ consumers and service providers in New South Wales and Victoria, we examine the connections between sexual and gendered experience, and drug consumption. Drawing on insights from STS we demonstrate how the sexual and gendered effects that consumers attribute to particular substances are produced in relation to various other actors, arrangements and networks. By including a broad range

of chemicals (including illicit drugs, antiretrovirals, hormones, and performance and image enhancing drugs), and focusing on practices of self-experimentation, and on the framing of service provision, we draw attention to the innovative cultures of care that emerge outside the terms of professionalised public health discourses. Recognising that pleasure, risk, care and intimate experimentation are significant features of LGBTQ cultures, we explore how these phenomena shape each other across a range of different settings with implications for how LGBTQ communities are governed. We conclude with observations about the relevance of our findings for LGBTQ health policy and practice, noting both the successes and the limits of existing responses to substance use amongst sexual and gender minorities.

Transforming gay men, sex and drugs: from fear to pleasure *Maurice George Nagington, University of Manchester*

Representations of gay men using drugs in their sex lives (colloquially called "chemsex") in the period between decriminalisation and the AIDS epidemic beginning often portray drugs as incidental to sex and rarely give them agency to direct gay men's lives and pleasures. However, contemporary representations in films, novels and plays almost always implicate drugs as powerfully causative agents in relation to tragedies, traumas, deaths, sexual assaults and HIV seroconversion; resulting in claims repeatedly being made that chemsex is one of the biggest crises in the gay community since AIDS. As such, a sense of fear develops about the purported risks of chemsex and it becomes abjected in an attempt to conserve gay male sexuality. Calls are then made for gay men to uncritically replace chemsex with reliable, repeatable and stable intimate relationships as if they were the same thing or gave the same outcomes. In this paper I will draw on longitudinal qualitative interviews with gay men who engage in chemsex to explore how they are aware of these contemporary representations, but frequently resist the conservative force of fear by: developing and sharing strategies to transform the risks of chemsex into pleasure; and, engaging in social networks that develop liberal rather than conservative forms of pleasures.

Thinking Sex, Drugs, and HIV: Building Up and Sustaining a Transversal Orientation toward Metastructural Issues and Irresolvable Problems *Stephen Molldrem, The University of Michigan*

In the last decade, the fields of HIV/AIDS prevention, care, and surveillance have experienced fundamental transformations driven primarily by new health information technologies (IT) and pharmacological advances. During this period, social scientific and humanistic studies of HIV/AIDS and biomedicine, sexuality and AIDS, the criminalization and surveillance of people living with HIV, and the licit and illicit drugs associated with the AIDS epidemic have similarly experienced a renaissance. In this paper, I argue that new realities stemming from changes in regimes of truth about AIDS call for novel approaches that can account for what I call "contemporary metastrucutral issues" and "irresolvable problems" that structure the AIDS epidemic and inquiries into it. Drawing upon theories of "materialization" and "reality," I argue that HIV researchers should assume a "transversal orientation" toward HIV: a mode of inquiry that can analytically operate across multiple scales, and which can adequately

describe the vastly different and potentially limitless sets of systems and actors that are involved in the production of realities shaped by HIV (from World Health Organization standards to local teams of data entry staff). I take cues from a transnational group of scholars and practitioners who have called for and contributed to new paradigms in the study of HIV/AIDS and its effects on sexuality, medicine, individuals, (sub)cultures, and societies. The paper draws upon extensive ethnography and health policy research with practitioners in Metropolitan Atlanta and among U.S. federal policymakers, as well as my experience building a nonclinical HIV testing program.

Experimenting with Life Itself: Digital Drug Worlds and the Transformation of the "Human" *Melina Sherman, University of Southern California, Annenberg School for Communication & Journalism*

My project examines how drug use is redefining what it means to be human, taking as its focus the arrangements of discourses, practices, institutions, and technologies that characterize the world of drug use in the ongoing U.S. "opioid epidemic." The opioid epidemic, I contend, is a useful case that illustrates many of the ways in which drug use is currently shifting: Every day, we are confronted with the arrival of new kinds of powerful, synthetic drugs, new ways of consuming them, and new technologies that seek to govern drug-using bodies, on the one hand, and produce new forms of community and political discourse, on the other. Through a digital ethnography, I examine the ways in which drugs, bodies, and experimentation interact in the digital realm - forming new social configurations and modes of chemical creation, distribution, and consumption. In doing so, I argue that drug research must expand its focus beyond substances (and substance users) to consider the system-wide logics that condition the interactions between human bodies, technology, culture, and politics. Such a holistic approach, moreover, enables us to address several crucial questions of our time: How is our growing access to new technologies changing how we understand ourselves as humans? How do our interactions with these technologies enable us to conduct new kinds of experiments that modulate the human experience? What consequences does experimentation have for human agency? And how might experimentation be understood as a means of transforming the meaning of "the human" and the experience of life itself?

More than selfish rationality: exploring "drug altruism" on a Dark Net Market *Tim Squirrell, University of Edinburgh; Angus Bancroft, University of Edinburgh*

Existing literature on Dark Net Markets suggests that they exist as spaces in which individuals approximate selfishly rational actors. This paper contests this characterisation, focussing on a popular forum accessible through Tor hidden services. This forum acts as a hub for the discussion, advertisement, sale and review of psychedelic drugs. Using observation ethnography and discourse analysis, this paper explores the prevalence of the attitude of "drug altruism" on the forum in five strands. First, it examines the differences between discourse about drugs on this forum and other DNMs in the literature, rooting these differences in the exclusive sale of psychedelics. Second, it analyses the boundary work performed by users and moderators as to which drugs are and ought to

be available for advertisement and sale. Third, it looks at the culture and rules of "free hits": doses of LSD or other substance which are distributed to individuals free of charge. Fourth, it examines the stated motivations of users for participation in the forum, highlighting the importance placed upon learning and education. Fifth and finally, it analyses the primacy of safety and harm reduction in the forum's discursive space. This paper makes three key contributions to the STS literature: it contests existing conceptualisations of DNMs as amoral spaces; it exemplifies the ways in which boundary work is performed in "underground" communities; and it explores social interactions in poorly understood and stigmatised spaces.

Session Organizers:
  Kane Race, University of Sydney
  Kiran Pienaar, Monash University
  Dean Anthony Murphy, University of Sydney
Chair:
  Kane Race, University of Sydney

161. Critical Data Studies: Ethics and Human Contexts of Data Science I
Papers for Open Panels/Critical Data Studies: Human Contexts and Ethics
Open Panel
9:00 to 10:30 am
ICC: E3.3

This session is the first in a series of three that will explore the ethics and human contexts of data science. The papers in this panel address questions of affect in data science practice, including investigations in fieldsites such as fintech and academic data science.

Participants:
  Locating ethic in different human contexts: just another integration problem? *Charlotte Mazel-Cabasse, UC Berkeley*
    In recent years, the ubiquity and omnipresence of data have forced us to think through the epistemic and methodological challenges of working with heterogeneous data in interdisciplinary collaborations, where experts and non-experts, scientists and data analysts need to re-imagine the condition of knowledge making. In this context, the role of the embedded social scientist has also evolved, often being more integrated into teams and tasked to reflect, advise and sometimes act on the many social dimensions that surround the scientific workflow. Drawing from insights from recent fieldwork, the paper reflects on the question of integration of heterogeneous human contexts and ethical frameworks. Looking back at what had started as a classic STS research project among environmental scientists and local communities developing a data science infrastructure aimed to facilitate ecological and cultural knowledge conservation, we'll try to unpack the challenging experience of navigating uneven expectations and often antinomic normative and ethical considerations. Following a symmetrical anthropology approach drawing from Michel Callon (1986), the paper will try to account for the human contexts can challenge the situated and often ethnocentric understanding of what is considered ethical. Finally, the paper will open the discussion on the potential (or the lack of thereof) of computational science tools, practices and interfaces as a new "place" for situated narratives, political engagement and ethical

practices within academia and beyond.

Text Mining as Creative Différance *Patrick Herron, Duke University*
    Text mining (TM), with its wide array of contributing disciplines, methods, interests, and histories, remains a field pulled in different directions. As a result, the philosophical foundations of TM remain undetermined. Nonetheless, TM has regularly been defined as an endeavor of discovery, specifically, the computation of new ideas from extant texts. The imaginaries of TM and its closest relatives (information retrieval, natural language processing, data mining, and artificial intelligence) are entwined with the imaginaries of digital capital, the Internet, and computation. This family of imaginaries, fueled by discursive regimes of exploration, colonization, warfare, espionage, criminal science, and profit, have made TM possible but have also limited its possibilities. TM's characteristic doublespeak of discovery and the double consciousness needed to sustain it gives rise to a similarly limited AI, risking the development and proliferation of a narrow if not altogether dangerous model of human intelligence that at best constructs innovation entirely out of translation, neglecting invention in the process. Through an examination of TM (Claude Shannon, Vannevar Bush, John Tukey, and Marti Hearst), the author argues that TM can be re-framed in creativity rather than discovery. By acknowledging and appreciating TM's status as a "trading zone," and elevating the primacy of making, the author reimagines TM through continuous chains of meaning-making, partial knowledge, iteration, creativity, augmentation, and collaboration. Such reimagining leads to more robust tools and methods for a wide array of disciplines and endeavors. Examples of such tools and methods are presented.

The passions and the p-values: overwhelming openness and the affective labor of radically public scholarship *R. Stuart Geiger, UC-Berkeley Institute for Data Science; Laura Noren, Obsidian Security*
    This paper integrates autoethnography, qualitative interviews, and fieldwork conducted in academic and industry data science environments to explore the emotion work and affective labor (Hochschild, 1979) in today's radically public conduct of scientific research and publishing. The open science and reproducibility movements are calling for significant changes to the practice of science. Researchers from across fields are increasingly obligated to share data, analysis, code, and other materials for replicating published studies. Many fields are having intense debates over what replication entails and the relevance of p-values -- particularly psychology and clinical trial research (Taichman et al., 2016; Benjamin et al 2017; Lakens et al., 2017). More broadly, such movements are taking place in the context of a rise of computationally- and data-intensive research, which is shifting conditions under which knowledge is produced. Previous work has examined competing values in these movements (Fecher and Friesike 2014) and examined the work of openness (Levin and Leonelli 2017). In this paper, we take an affective approach to these changing contexts of the conduct of science, focusing on the experiences and emotions of early career researchers. We have observed how this institutionally unsettled ground has consequences for researchers,

especially in relation to career paths. Researchers must make uncertain, potentially high-risk decisions about whether to release their data/code publicly, to post pre-prints of draft papers prior to peer review, to take public pledges to uphold principles of open science, to attempt to replicate a high-profile published study, to publicly critique a published study, and more.

The stakes of defining data science *Laura Noren, Obsidian Security; R. Stuart Geiger, UC-Berkeley Institute for Data Science*

The term "data science" has exploded in popularity, but there is still substantial ambiguity about what data science 'really' is -- it means anything at all. Originally envisioned by funders and key faculty to be broadly inclusive "trading zones" (Kellogg et al,. 2006) in which data science techniques could bring disparate fields together, we explore how the work of defining data science both adds and removes collaborative friction. Moving from a single conceptual definition of data science into the lived reality of developing curricula, securing funding, building infrastructure, charting career paths, and working out interdisciplinary collaboration reveals what is at stake in the definition of key terms. Like any discipline or profession, boundary work is done to define and delimit the contours of data science (Gieryn, 1983). Drawing on ethnographic fieldnotes and qualitative interviews at three universities with data science initiatives, we analyze debates about definitions of data science and the role of data scientists across contexts. These definitional issues reveal underlying intellectual, scientific, and cultural differences between disciplines. We walk through a series of five vignettes that capture the recent evolutionary history of data science, describing what is at stake for those employing and impacted by applications of these methods. We argue that the way these disciplines have addressed their internal challenges around defining data science has shaped the constituencies and projects that can be incubated in the data science environments.

Defining the Informatic Person: Exploring How Data Relationships Are Created and Negotiated in Informatic Contexts *Ashlin Lee, Australian National University*

Everyday life is informatic in nature, and requires ordinary people to negotiate "patterns of living that emerge from and depend upon access to large data banks and instantaneous transmission of messages" (Hayles 1999:313). This paper explores this negotiation, and suggests an original theoretical framework, that of Informatic Context and Informatic Persons, to capture the dynamics of data present in everyday life. The Informatic Context is the context of data and data technologies in contemporary society, and is defined by the presence of Data Interfaces (that connect individuals to digital contexts), Data Circulation (trends in the movement and storage of data), and Data Abstraction (data manipulation practices). Informatic Persons are those who reside within this context. The paper uses a unique interpretation of Irwin and Michael's (2003) STS Theory of Ethno-Epistemic Assemblage to identifies how data creates highly scalable social relationships, that are managed through narratives of control. Digital mediations have the potential to change the scale of relationships, connecting any interactions to broader socio-technical contexts. These relationships are managed through a narrative of

control, with Informatic Persons emphasising their heightened capacity for controlling life through the Informatic Context, despite the limitations of individual agency and technology. This presents ethical implications for users and platforms. It raises questions about the agency and responsibility of users and platforms, and the nature of conduct and decision making in the Informatic Context.

Seeing Like a Supply Chain: Understanding Data in Logistics *Miriam Posner, University of California, Los Angeles*

Supply chains, as Deborah Cowen and others have shown, are critical to understanding the global economy. As offshoring has become increasingly ubiquitous, supply chains have become head-spinningly complex. Vendors and subcontractors nest inside each other like Russian dolls, and manufacturers claim that they can't keep their own supply chains straight. Nevertheless, just-in-time production and rapid cycles of obsolescence require that commodities be handed through the supply chain with minimal latency. To manage this complexity and mitigate risk, corporations have turned to complex supply-chain management software, which identifies and "heals" rifts in the network of suppliers. This presentation investigates the growing prevalence of machine-learning techniques - algorithms that "learn" and evolve from massive pools of data - in supply-chain management. As the global market roils and the market permits ever-smaller margins, supply-chain management software incorporates increasingly sophisticated machine-learning algorithms, turning to neural-networking models and multi-agent systems, among others, in an effort to eliminate supply-chain latency. These algorithms rely on very particular facts even as they ignore others, resulting in the curious circumstance that Apple can deliver an iPhone to a customer with exquisite speed while also claiming (accurately) near-total ignorance about the labor conditions of its subcontractors.

Session Organizer:
Laura Noren, Obsidian Security

162. Smart Homes in Everyday Life: Assisted Living, Service Work, Ethics and Energy
Papers for Open Panels/Smart homes in everyday life: Labour, leisure and pleasure
Open Panel
9:00 to 10:30 am
ICC: E3.4
This session is Part 2 of the 'Smart homes in everyday life: Labour, leisure and pleasure' panel.
Participants:

Smart Energy Use In Everyday Life *Ingvild Firman Fjellså, NTNU, Dept. Of Interdisciplinary Studies Of Culture; Marianne Ryghaug, Norwegian University of Science & Technology (NTNU); Tomas Moe Skjølsvold)*

Smart meters are currently rolled out on a large scale in Norway. These meters and connectable gadgets are expected to become part of the working relations of homes, both through reducing the demand for electricity, and through producing new modes of "flexible" consumption. From a system perspective, policy makers and industry see this as desired contribution, supplementing the expansion of electricity grids. The transition is a step in the direction of digitalizing both grids and homes, and to "smarten up" Norwegian homes

(and their residents). Through a qualitative analysis, we explore how actors in industry and research imagine the energy use of home. Specifically, we will investigate what expectations experts have towards ordinary householders concerning their ability and willingness to provide flexibility. Thus, we look at how they mobilize homes as resources in energy system transformation, and the ways that homes are expected to take on new kinds of work in the interest of the system, We compare experts' visions with accounts from a broad spectrum of ordinary consumers and their everyday experiences and practices. The smart meter is presented as a neutral digital device meant to offer information, giving householders the opportunity to make informed and rational decisions about electricity consumption in their everyday life. From an STS perspective the device can be viewed as a facilitator enabling solutions that commodifies the activities that goes on inside homes, translating them into "flexibility". We discuss how a commodification of end-user flexibility potentially can entrench class and gender dynamics, feeding into established patterns of resource distribution.

The Ethical Perspectives on Ambient Assistive Living Technologies of Japanese Engineers. *Jungen Koimizu, Graduate Schools of Medicine, Osaka University; Kazuto Kato, Graduate Schools of Medicine, Osaka University*
Ambient assistive living technologies (AAL technologies), including assistive technologies and companion robots, are expected to allow the elderly care recipients to stay living at their preferable circumstances. However, the spread of AAL- technology products is still slow. It is partially because the caregivers concern the ethical issues in the use of AAL technologies, although the engineers might take such issues into account in the development process of their products, as the practice on responsible research and innovation (RRI). It is also said that the ethical concerns need to be translated into sharable concepts among the stakeholders in order to let them understand their concerns and efforts on the issues. In this study, we focus on the perspective of engineers who are required to be ethically responsible for the development and also the use of AAL technologies. Employing semi-structured interviews, we explored the ethical perspectives of the engineers who developed AAL technologies in the commercial companies. At the same time, we also observed the influence of their interests as the members of the companies, and the influence of national program which evaluated the risks of their products. Our findings are narrated in the context of the previous literature which discussed the ethical issues on AAL technologies, and provide the empirical description of the Japanese engineers' ethical perspectives. The engineers concerned the restrictive influence of rules, but they also hoped that ethical guidelines for development of AAL technologies would be established, having faced various dilemmas as one of the stakeholders.

The Sensing Home: Citizen Engagement with Sensing Energy Infrastructures *Ingrid Ballo, University of Bergen; Kjetil Rommetveit, University of Bergen, Norway*
Visionary statements of energy futures accompany the introduction of sensing devices in the power grid and within individual household. These include a broad range of desirable goals which seems to be within reach; such as a 'self-healing grid' or future 'smart homes'. A

sociological view on the implementation of smart energy imaginaries would hold that such lofty promises of potential benefits are actually complex boundary objects created to entice actors with a range of differing and contradictory interests into innovation and collaborations aimed at large-scale infrastructural developments. The smart or sensing household is a space where sociotechnical energy imaginaries meet lived experience and social (energy) practices. Through empirical examples from projects on participatory 'smart' energy management exploring aspects of citizen engagement and social acceptability of new smart energy devices and infrastructures in three European cities, as well as accounts from relevant literature, we illustrate some of the complex ways in which new sensing energy infrastructures and smart technologies are entering the everyday life of citizens. While smart devices could perhaps contribute to increased engagement for home energy management by making 'invisible' or black-boxed energy infrastructure more visible and accessible for citizens, the range of this citizen engagement is limited due to the ways such smart devices seems to be designed with an imagined citizen/public (Resource Man) in mind. This illustrates the need for broader and multiple approaches to citizen engagement for changing energy practices in future 'smart homes'.

The Surveillance and Choreography of Service Work in the Smart Home *Christopher O'Neill, University of Melbourne*
There have been several recent innovations in smart home security designed with the intention of choreographing and monitoring service work. In 2017 Amazon caused a stir when it announced its Key service, which would allow Amazon delivery workers to enter the front door of users' homes. Walmart has recently announced plans to produce a smart lock system which would allow homeowners to remotely monitor delivery workers as they deliver food directly into the customer's fridge. Vivint meanwhile have patented a smart lock designed at regulating the movements of service workers, which would allow the home owner to choose a "predetermined level of access [which] may include a duration of usage, a time frame of usage, access limitations to selected areas, or some combination thereof' (2017: np). This paper shall examine how service work is being imbricated within the design of the smart home. Heckman (2008) has drawn attention to how the smart home becomes a 'set', scripted to produce the elements of "The Perfect Day", or of "pleasance" (Strengers & Nicholls 2017). What these new developments demonstrate is the capacity for smart home security technologies to modulate the boundaries of the home, enabling differentiated degrees of access which can be extended and withdrawn at the discretion of the homeowner. This implies new forms of "digital housekeeping" (Tolmie et al 2007), but also compels attention to how the smart home is integrated within a broader economy of service work, and how domestic service is choreographed and imbricated within other lifestyle scripts.

'We're the Cheap Smart House': encounters with smart in the shared home *Sophia Maalsen, The University of Sydney*
Practices of sharing offer unique lines of enquiry into understanding the impact of smart ontologies and the entrepreneurial, innovative and everyday use of smart technology on the work of making home. In this paper I

draw upon empirical research conducted with share housing tenants in Sydney, to understand how smart technologies are applied in the share house. This is significant in that it shifts focus from the dominant smart home imaginary as owner-occupied single-family dwelling – a tenure type perpetuated by home ownership ideologies – and instead looks at a household type that is gaining significance in response to increasing housing affordability pressures. This has important implications for both technology producers and consumers as the reconfiguring of household types evidenced by declining home ownership and correlated increases in renting and sharing housing, creates new limitations and opportunities for smart home technology. Understanding how smart devices are applied within share houses illustrates that share households, occupied by tenants from diverse backgrounds with varied user needs, prioritize different capabilities of smart home technology. My research reveals that smart devices and digital technologies play an increasingly important role in the social labour of the home, mediating flatmate relationships and managing the household. Acting as a digital mediator and household organizer, 'smart' in the shared home is less attuned to aesthetics, security and leisure, but has greater applications in negotiating the difficulties inherent in living in non-familial households with diverse tenant cohorts.

What is the connection between Health Smart Homes and user-wellbeing? *Rachel Creaney, University of St Andrews/ James Hutton Institute*

Currently the world is faced with the prospect of an increasingly ageing population known as 'the elderly demographic time bomb', (Layzell et al, 2009: 167), particularly in rural communities. My research critically assesses the ability of Health Smart Homes (HSH) to enhance the wellbeing of older residents. HSH enable the residents to remain independent and safe in their own homes by utilising Smart Technologies for assistance with, and monitoring of, their healthcare. Demographic ageing places increasing demands on (healthcare) services, and one suggested solution encourages older people to live independently in their homes for longer through HSH. HSH can help 'promote healthy behaviours, detect diseases in an early stage, improve treatment compliance and provide support for informal caregiving' (Dishman, 2004: 34). Much of the literature to date has emerged from healthcare and technocentric domains (e.g. Mano et al, 2016; Sixsmith, 2006), rather than a broader consideration of user (dis)benefits. For instance, the changing relationship of between resident and home after the installation of Smart Technology, as well as what this means for the boundary of the person and their wellbeing deserve greater consideration (e.g. biopolitics and the (re)construction of society and the person in line with this technology). Thus, this paper explores the extent to which householders are empowered through both 'ageing-in-home' and with their relationship with Smart Technologies. It also offers a view into householders' experience of living in HSH and is informed by interviews with health and social care practitioners in Scotland, involved with Health Smart Homes.

Session Organizer:
Yolande Strengers, RMIT University

Chair:
Jenny Kennedy, RMIT University

163. Concepts and Practices of ELSI: 1. ELSI as a Political Terrain
Papers for Open Panels/Concepts and Practices of ELSI: Exploration of its plurality
Open Panel
9:00 to 10:30 am
ICC: E3.5
This is the first of the two open-panel sessions on "Concepts and Practices of ELSI: Exploration of its plurality." Almost three decades have passed since the program on ethical, legal, and social implications/issues (ELSI) was first conceived in the United States as part of the Human Genome Project. Scientists and policymakers increasingly accept the idea that major scientific breakthroughs and development of novel technologies ought to be accompanied by discussion on their ELSI. This trend has also provided a potential platform through which scholars of social sciences and humanities, including those specialized in the field of STS, can engage and, in some instances, critique what is being done in a laboratory and beyond. However, understandings of what counts as ELSI as well as practices intended to address it seem to differ considerably across places, times, and topics. The sessions aim to explore such plurality of ELSI – in terms of both its concepts and practices. This first session focuses on recent advances in bioscience/biotechnology and examines how their ELSI is framed. Because framing of their ELSI reflects who has the voice in their governance and also indicates what kind(s) of action would have to be taken to address it, it is an important part of their politics. We look at various ELSIs of emerging biosciences/biotechnology through a STS lens and examine how they contribute to making (and unmaking of) such biosciences/biotechnology in this session.
Participants:

Biomedical Ethics and Policy on Emerging Biomedical Technologies *Jusaku Minari, Kyoto University*

Emerging biomedical technologies, such as genome sequencing and genome editing are increasingly becoming a hot topic for debate across the world. As many national-level initiatives in genomics aim to utilize genome sequencing for individualized diagnosis, prevention, or even treatment of a range of diseases, it is becoming imperative to address its ethical, legal and social implications (ELSI), such as the value of front-loaded informed consent, privacy protection using genomic data and biological samples, and the uncertainty on the return of individual results. In contrast, on genome editing, while much expectation is directed towards development of new approaches to prevention and treatment, broader ethical and policy issues, including the interest of future generations and the concerns over human enhancement and biodiversity conservation, have been debated. In both cases, however, not only scientific approaches but also social and policy ones should play key roles particularly in balancing effective scientific advancement and protection of (local) social values. Reflecting on the recent experience in Japan, this paper explores biomedical ethics and policy on these emerging biomedical technologies, and suggests some major issues that need to be addressed, in particular relation to the nature and roles of government interventions, such as ethics regulation and research funding.

Oversight and Evidence in Stem Cell Innovation: An Examination of International Guidelines and Emerging

Trends in Regulation *Tamra Lysaght, National University of Singapore*

Disputes have recently emerged in the public, bioethical and professional discourses over whether certain types of stem cells may be administered to patients as innovative therapies before evidence of safety and efficacy has been demonstrated in clinical trials. Two professional organisations have issued guidelines that offer different perspectives on when it may be ethically justifiable to innovate with stem cells in clinical settings. In this paper, I examine the guidelines of both organisations with respect to how they each attempt to frame innovation with stem cells as either research or practice and define what ought to constitute as oversight for such innovation. I argue that, through these guidelines, both organisations are attempting to establish legitimacy for their version of an evidence-base and assert epistemic authority over the emergent field of regenerative medicine. I also discuss international trends in regulation that are aimed as accelerating the market approval process for innovative stem cell-based products. Implications for establishing standards of evidence and oversight frameworks for stem cell innovation are discussed.

Taming the Dual Use Concern: A Case Study of a Molecular Robotics Laboratory in Japan *Ken Kawamura, Seijo Univerisity*

The problem of dual use technology not only poses a real challenge for civil society in the effort to prevent harmful misuses of it, but is also a cause of serious concerns for scientists working to develop such technologies, especially new inventions at the research and development stages. While scientists are seriously worried about potential misuses of their research outcomes, at the same time they are possibly hampered by the rigid regulations that severely limit their research activities. In this presentation, I shed light on how scientists deal with dual-use concerns, based on an interview survey conducted on researchers working for a molecular robotics laboratory in Tokyo. Molecular robotics is an emerging discipline involving the design and creation of biological structures that serve various purposes by manipulating the order of nucleotides in DNA. In other words, it is the process of creating nanoscale robots utilizing the self-replicating capacity of DNA. Although the current accomplishments of the field remain experimental (including some non-functioning geometrical structures), the potential applicability of these structures is immense—as are the consequences of their misuse. Based on the analysis of the interview data, I show how the researchers in this molecular robotics laboratory organize their research projects while facing and coping with the dilemma posed by the potential risk of misuse and the concerns regarding excessive control. This presentation details a case study on how the researchers' own considerations regarding the ethical, legal, and social implications (ELSI) of technology shape their research practices.

ELSI without RRI Perspectives: Cases of Japanese Biological Societies *Ryuma Shineha, Seijo Univerisity*

This paper analyzed role and current situation of academic societies for education for Responsible Research and Innovation (RRI), considering the progress of discussions of RRI. Content analysis of guidelines, statements, and related documents of 133 Japanese academic societies in biological fields was conducted. As the result, there are mentions to Ethical, Legal, and Social Issues (ELSI) and science communication, on the other hand, there a few mentions to several important contents of RRI related to inclusion such as "sense for the minorities and the handicapped" and "antidiscrimination". At the same time, there are few discussions on dual use. It seems that this lack of viewpoints of RRI have same root of narrow understanding of broad impacts of research activities among scholars. We should consider these current situations into future discussions of RRI education.

Session Organizer:
Koichi Mikami, KOMEX, University of Tokyo

Chair:
Koichi Mikami, KOMEX, University of Tokyo

Discussant:
Steve Sturdy

164. Organisations, institutions and governance
Single Paper Submission
Open Panel
9:00 to 10:30 am
ICC: E3.6
Participants:

Organisational Interdependencies and Crisis Response in Sociotechnical Systems: A Case Study of Security Services Organisation *Justyna Tasic, Nanyang Technological University*

This research addresses the major challenge of understanding how crisis response is determined in complex sociotechnical systems. The organisational response to permeating crisis is as a product of an interplay between entangled organisational structure, personal attributes and organisational components. On the one hand, organisational behaviour, primarily rooted in normal-state operations, tremendously affects system's capacity to respond to crisis. On the other hand, the response is conditioned by organisational components manifested in available buildings and equipment, services, information resources as well as crisis management and leadership, and anticipatory practices, etc. While the material components are easy to identify, human interactions are hard to detect and measure. In this study, the organisational interdependencies are described as multidimensional work-based relationships shaped by personal, social and organisational factors. More specifically, they are analysed as networks of actors embedded in the specific sociotechnical context. This study aims to analyse how various dimensions of organisational interdependencies and organisational components impact the response to different crisis scenarios. The research methodology is based on a case study approach that combines both qualitative (questionnaires, observation) and quantitative methods (social network analysis). By identifying consequences of organisational interdependencies and organisational components in crisis responses, this study seeks to provide new insights on sociotechnical resilience.

Decision Making Process in a High Energy Physics experiment *Emiko Adachi, RIKEN*

This case study research examines a decision making process and a knowledge creation process in an international, large-scale physics experiment group using

a large collider, members of which come from various institutes and universities around the world. The High Energy Physics group called PHENIX has over 500 scientists. They set up a four-step decision making process. Some part of that is written in an official group rule. Comparing with other experiment groups like STAR, ATLAS, and CMS, conducting interviews and document analysis, I explain the PHENIX management features. I focus on the PHENIX Group's democratic way to decide important things in the Collaboration. The findings of this case study are that this worldwide collaboration succeeded by democratic management style. I discuss about how the group developed a complex technological system like the detector, attracts many brilliant scientists, handles a pile of scientific data and information in such distributed scientists, and makes decisions from a management perspective.

Policy implications for the improvement of Technology transfer and commercialization process in the Indian context
Bhavisha P Sheth, Entrepreneurship Development Institute of India

Scientific innovation has resulted in development of newer technologies for the betterment of humankind. The academic and research organisations are the places where these technologies are actually ideated and/ or invented. However, the process of technology transfer as well as its eventual successful commercialization covers many other facets in addition to the scientific research alone. Here, we also present an extensive web survey of the technologies available for transfer/commercialization in twelve major Indian research organisations. A total of 2921 technologies were found to be available with respect to the above mentioned organisations, with the highest of these in agricultural sciences. Certain significant policy interventions from this study include- the need of a central framework for deposition, management and dissemination of institutionally developed technologies, more attention and support is required for the technologically less developed research areas as well as there is a need for promotion of funding mechanisms for the prototype development in addition to the already available funding schemes for other stages of technology commercialization. Hence, the successful commercialization of the innovation from the Indian research labs, requires the restructuring of the existing policies in order, to eventually facilitate the economic growth of our nation.

Global pharma power as failure of the State? Registration, procurement and access to medicines in Northern India.
Mathieu Quet, IRD

Based upon research in the state of Bihar, India, this paper argues that informal access to medicines in Northern India is a core element of the government of healthcare in India, although the country is often termed as the "pharmacy of the developing world". Informal providers such as unlicensed village doctors and unlicensed drug sellers play a major role in access to medicines in Bihar, in the particular context of the dismantling of public procurement services. Building on recent works in the socio-anthropology of pharmaceuticals, the paper shows the importance of taking into account the political economy of drugs built in India, in order to understand local problems of access more fully. If informal providers occupy such an important position in the government of

healthcare in India, this is partly due to the shaping of healthcare as access to drugs on health markets. Elaborating the argument from interviews with health professionals and patients, the paper first shows the situation of public healthcare and public procurement in Bihar ; then it presents the role of informal medicines providers ; at last it shows how patients deal with the fact that they live in a "pharmaceutical world" where access to health equates with access to medicines.

Session Organizer:
Justyna Tasic, Nanyang Technological University
Chair:
Justyna Tasic, Nanyang Technological University

165. Well Years, Good Years, Quality Years – Calibrations and Aggregations of Daily Living: Daily Living
Papers for Open Panels/Well years, good years, quality years – calibrations and aggregations of daily living
Open Panel
9:00 to 10:30 am
ICC: E3.8

Throughout the world low fertility, ageing and chronic disease are transforming how health/care is organised and practiced. Healthcare programmes are being reconfigured to address the challenges of treating and managing long term conditions just as persons with chronic conditions, family members and loved ones grapple with daily tasks of (self-)care. In low fertility societies there are fewer young people to care for elders, who are increasingly living with various co-morbidities and may require assistance in their daily lives. A wealth of instruments, indices and scales have emerged which take daily living as their object. Despite their differences, their commonality lies in their normative differentiation of the activities of daily living along better-worse continuums. Certain ways of living are valued as of better (in terms of quality, fulfilment, life satisfaction, etc.), based largely on a person's functional ability, levels of experienced discomfort, and experiences of isolation. Contributors to this panel will critically examine how daily living, itself, has become the object of measurement as healthcare programmes, professionals, carers and patients seek to improve the daily lives of those living with chronic conditions. Ethnographic, policy-oriented and historical analyses of how daily living is made knowable and calculable on the one hand, and negotiated and tinkered with on the other, are welcome. The panel will contribute to STS scholarship on health metrics, health interventions and (self-)care and will further conceptual innovation at the nexus of medical anthropology, medical sociology and STS.

Participants:

Measuring (what) Matters – Patient Rated Outcome and the making of experiencing patient publics *Henriette Langstrup, University of Copenhagen; Tiago Moreira, Durham University*

Patient Rated Outcome Measure (PROM) – originally developed for research on issues such as health related quality of life – are being mobilized widely in Western healthcare systems to ensure that clinical and governance decisions are based on measurements of "what matters to patients" (Coulter 2017) – that is data on patients' actual experiences with the effects of treatment. Specific tools – measures, algorithms, digital platforms – are entering the interactions between patients and healthcare system. Certain – datified and calculative – versions of patients' experiences become central to achieving a number of clinical, managerial and political goals. Exploring a

National initiative in Denmark establishing a questionnaire bank and a technical infrastructure for PROM, this paper aims at discussing the epistemological implications of the surveillant assemblage (Prainsack 2018) of PROM. How does this initiative and the related international trends co-constitute the phenomenon of 'patient experience'? Similar to the early twentieth century constitution of an 'attitudinal public' through psychometric measures (Young 2017) and practices of survey making (Igo 2007), we see PROM efforts as experiments in making certain kinds of experiencing patient publics mobilized to steer healthcare toward more sustainable and democratic configurations. However, the multiplicity of aims arising in the development, negotiations and uses of the particular PROM tools reveal tensions between patient experiences that are 'certified' and deemed 'relevant' and those that are not. Hereby we want to contribute to "a pragmatics of health" (Moreira forthcoming) that explores "the complex ecology of standards and measurements" and "how they generate difference and spark the moral imagination" (Ibid).

Unfixable Brains: Attaining Normalcy in Daily Living with Seizures *Stefan Timmermans; Tanya Stivers, UCLA*

Medical specialization and finicky drugs have created a distinct group of patients: the unfixables. In the past, these patients with difficult chronic conditions were discharged from clinics as unsolvable problems, but now remain under close medical care. For children living with seizures, the frequency of seizures and response to medical treatments indexes whether a seizure- and medication-free life is possible. Children, parents and clinicians oscillate between managing hope that a better future is possible and uncertainty that such a future is attainable. Based on 150 video-recorded clinic consultations, we examine how clinicians foreshadow whether epilepsy is fixable. Physicians set an outer boundary of hope for children's daily lives positioning them on a continuum of "fixability" with likely fixable as the most optimistic and likely unfixable as the most pessimistic position. We examine how clinicians and parents set measures of success for each group and negotiate a care relationship, even in the instances where the child can no longer aspire to a seizure free daily life. This research speaks to how the clinic emerges as a site of articulating a range of neurological selves where technologies and medical knowledge differentiate people living with seizures on an axis of fixability. We examine how this neurological axis then reverberates to the possibility that the child will be unable to drive, work or live unassisted. As such, this research speaks to the STS focus on neurological personhood and how it is negotiated between health professionals and those living under the specter of neurological unfixability.

Timing Care for People with Dementia: ADL and the Problem of Time in the Long-term Care Insurance Program in South Korea *Jieun Lee, University of Copenhagen*

In response to the aging of its population and the weakening of family's caring function, the Korean government introduced the Long-Term Care Insurance (LTCI) program in 2008. The LTCI program provides monetary supports for care services to the elderly who are unable to independently carry out daily living activities at home, or in institutions. The paper asks how the old care recipient and caring labor are figured in the LTCI grading system which is largely based on the Activities of Daily Living index and the time study for caregivers. Based on the analysis of policy reports and related materials as well as interviews with family caregivers and home-visit care helper, I explore how the LTCI grading system in Korea conceptualizes "daily living" as a series of "activities" to live a normal life for the elderly, and simultaneously a series of "tasks" to be done in a standardized and optimal manner. Especially when caring labor is done in the home of the elderly with dementia, the time study-based service allowance is highly questionable. The problem of "time" allowance that emerges around the LTCI program in Korea reveals the nature of caring labor as it is performed in situ in a specific location while dealing with specific "problems" and daily fluctuations of each client, as well as the problematic assumption about "daily living" and the declining elderly who is being "assisted" by the care workers.

From Drugs for Life to Living for Drugs: viewing hospice care from an institutional/pharmaceutical perspective *Wen-Hua Kuo, National Yang-Ming University*

This paper aims to provide observations about the end of life's journey from a perspective that echoes the recent STS scholarship concerning drugs and the human condition drugs create. Departing from existing literature that treats aging care and hospice/end-of-life care separately, this paper insists that observing the life paths of an aging individual is a necessity. It also argues for a preliminary yet serious investigation of aging people's social and bodily conditions as well as their dynamic relationship with pharmaceuticals. Among the numerous sites that emerge in an aging society, this study focuses on hospice wards, out-patient clinics, and health promotion centers. They were chosen in order to exemplify the social and cultural characteristics of how aging people cope with the inevitable routine of taking drugs. This paper hopes to reveal not only the ways aging people are provoked into taking drugs in order to maintain their way of life, but also the transfiguration of these people as they start losing control over their bodies and social lives and become subject to institutional care/death. Therefore, this paper is a scholarly snapshot of our lives on pharmaceuticals or, more exactly, pharmaceuticals lived out within an aging society.

Session Organizer:
Ayo Wahlberg, University of Copenhagen

166. Turning (More) Things into Assets: Techno-economic TRANSformations 1
Papers for Open Panels/Turning (More) Things into Assets: Techno-economic TRANSformations
Open Panel
9:00 to 10:30 am
ICC: E3.9

What is an asset? How is something made into an asset? How is the boundary of an asset defined? What is the role of technoscience in this transformation? Assets can include things like intellectual property, land and natural resources, personality, emissions, infrastructure, etc. More and more STS scholars (and others) are puzzling over the specific techno-economic transformations entailed in the creation of an asset (e.g. Birch 2017a, 2017b; Birch & Tyfield 2013; Cooper & Waldby 2014; Muniesa 2014; Lezaun & Montgomery 2015; Doganova and Karnoe 2015; Doganova and Muniesa 2015; Martin 2015; Chiapello 2015; Boltanski & Esquerre 2016; Gardner & Webster 2017; Hogarth 2017; Muniesa

et al. 2017; Vezyridis & Timmons 2017; Birch & Muniesa submission). Such work has stimulated an important debate on the importance of the asset form and assetization process in understanding an array of emerging phenomena in contemporary, technoscientific capitalism. They raise questions about the techno-economic implications of socio-technical platforms (e.g. Uber, Airbnb), digital business models (e.g. Google, Facebook), innovation financing and their financial logics (e.g. Silicon Valley 'unicorns'), emerging accumulation strategies based on forms of 'rentiership' rather than entrepreneurship, and so on. The aim of this panel is to contribute to this ongoing research agenda by (1) inviting further case studies of assetization and (2) focusing on the specific techno-economic transformations involved in the turning of things into assets. It has a further aim to consider the implications of the asset form and assetization process for our the future of contemporary, technoscientific capitalism.

Participants:

AngelList: Mass-Producing the Habitus to Assetize *Jacob Hellman*

This paper examines the mass-production of a particularly high-risk asset which is the early-stage technology startup. For decades, elite financial networks in prosperous cities controlled investors' access to these startup "deals." However, new online marketplaces such as AngelList and WeFunder are opening up such opportunities to broader participation. These equity crowdfunding platforms claim to be "democratizing" access to wealth-generating assets. But in doing so, they are also promoting a particular mode of financialized reasoning as an everyday practice (Chiapello 2015). This incursion goes far beyond valorizing investment as a virtue of individual fiscally responsibility (Davis 2009). Rather, it disseminates a habitus whereby the world appears as brimming with potentialities which are rapidly scalable and then liquidate-able. And while business schools have long cultivated the habitus for valuing corporations (Muniesa 2016), such asset-making labor has typically involved face-to-face relations with entrepreneurs, and calculations based on past revenue. What happens when such sense-making happens on online platforms? And likewise, what sociotechnical futures will take shape when these platforms circulate and authenticate a startup team, rather than a crowdfunding video? I begin to answer these questions through an analysis of (1) the self-presentations of investors and entrepreneurs on AngelList, (2) the "term sheets" and contracts by which AngelList turns an entrepreneur's idea into an investment, and (3) recent loosening of American SEC regulations on these high-risk capitalizations of private corporations. bibliography Chiapello, E. 2015 "Financialisation of Valuation." Human Studies 38:13–35 Davis, Gerald (2009). Managed by the Markets. Oxford University Press. Muniesa, Fabian (2016). "Setting the Habit of Capitalization." Historical Social Research 41:196-217

What's Your Business Plan: The Technology Statement and Commodification in the Technology Incubators in Beijing *ShihMing Wu*

The aim of this study is to explore how the technology is stated in the financial context. The technology incubator is a space that concentrates the knowledge, capitals and entrepreneurs for innovative business. The new landscape of policies has made "technological innovation and entrepreneurship (in Chinese: Shuang-Chuang)" be the central concepts of the changing Chinese society. Thus, the roles and relationships of the investors, entrepreneurs, workers and the authorities in the space have changed during the adoption of new policies. However, there is a lack of studies of the representation of innovation from the investors and entrepreneurs' perspectives within incubators that shaped the development of technological commodification. The cooperation, negotiation or conflict between the stakeholders inside have also been discussed rarely. Therefore, this study focuses on the activities of technology statement on the business plan, a common document for communication of equity investment between the investors and entrepreneurs, and how the technological path and technical products are influenced by financial and accounting factors. The research carried out the text analysis of the processing business plans from the companies in the incubators in Beijing, China. The participant observation, field survey and interviews with the members of the investors and entrepreneurs were also conducted, attempting to reveal the financial logics behind the incubators, and revisit the theories of social construction of technology.

Asset Form, Asset Boundary, and Assetization in Technoscientific Capitalism *Kean Birch, York University*

What is an asset? How is an asset defined? What does this mean for asset valuation? All such questions are subject to contestation in the development of techno-economic practices, knowledges, and governance (e.g. valuation, accounting, corporate governance, etc.). This is especially the case in contemporary, technoscientific capitalism where there is an increasing emphasis on 'rentiership' as an accumulation strategy – here, rentiership is defined as the capture of profits from the ownership and control of assets as the result of their natural or artificial scarcity, productivity, and quality. As an example, this paper will look at the emergence and role of the asset form and asset boundary in technoscientific capitalism resulting from changing techno-economic knowledges (e.g. Systems of National Account) and techno-economic property regimes (e.g. global investment treaties).

Better than Gold: Art in Storage Spaces *Christoph Rausch, Maastricht University*

Since the 2007-2008 global financial crisis, the art market has exploded. A low-growth global economy, low interest rates, and surging asset prices turned artworks into safe havens for transnationally mobile private wealth. Key to this investment trend are new types of art storage spaces, including 'freeports' where artworks are stored 'offshore' and traded tax-free in climate-controlled bunkers. Here, however, art becomes more than a mere store of financial value. Rather, novel practices of insuring, collateralizing, and securitizing art in storage effectively financialize art through storage. This financialization problematizes both public and private relations between art and finance, as new financial products and services offered through art in storage affect established norms and forms of art ownership and display. New economies of enrichment create new dimensions of financial speculation, introducing new uncertainties and risks as well as new opportunities for tax avoidance and evasion. These, in turn, manifest new global forms of wealth concentration and inequality, which may necessitate the adaptation of (self-)regulatory and redistributive frameworks. Researching how art is currently financialized in and

through storage, my project analyzes the far-reaching implications of new types of art storage spaces. Doing multi-sited ethnographic fieldwork at and around these art storage spaces, I study the contested technologies, politics, and ethics of art storage and art financialization practices. I add to theories of globalization by conceptualizing as global finance assemblages the technical infrastructures, administrative apparatuses, and value regimes transnationally networked around art storage spaces. Based on recent histories of collecting and exhibiting modern and contemporary art, I demonstrate how global finance assemblages now accumulate financial profits from past and present artistic futures. I aim at a better understanding of global art-market dynamics, including imagined futures of boom and bust.

Disassembling Coal: Finance Capital, Environmental Law, and the Right to Information in South India *Mukul Kumar*
This article calls for an analysis of how coal is assembled and disassembled as an object of global financial investment. Since the liberalization of India's energy sector began in the 1990s, the government has developed a range of technologies to make coal an attractive asset for investors. The pharaonic Ultra Mega Power Plant Project (UMPP) program is one such technology which assembles finance capital, land and environmental clearances by creating opaque structures called Special Purpose Vehicles (SPVs). Coastal fishing villages in south India are challenging the UMPP program through environmental litigation and Right to Information (RTI) activism that has far reaching consequences in global financial markets. Based upon fieldwork with a collective of fishers, lawyers, and activists, I argue that disassembling coal requires not only challenging the land and environmental clearances of coal infrastructures, but also disrupting the assemblage of elements that constitute coal as frontier of global finance capital.

Property as Socio-Technical Infrastructure *Oviya Govindan*
The recent spate of hurricanes has devastated coastal regions around the world, and is forcing people to re-orient their everyday social lives to reckon with shifting oceanic environments. Scholars have noted that there are similarities between the varied hurricane-hit regions from Houston, Puerto Rico to other flood-prone regions like Bangladesh or Mumbai (Ghosh 2017; Sobel 2014). Across these contexts, regional environmental activists, national governmental bodies and transnational actors (TERI 2014; World Bank 2011) have argued that in order to fix the problems of climate change and rising sea levels governments must fix the legal meanings of property. In India, technocratic fixes of property use have emerged as the dominant discursive focus of environmentalists. In this paper I draw on STS approaches to the study of law and infrastructure (Riles 2011;Star 1996) and concepts of socio-technical imaginary (Jasanoff and Kim 2015) and preliminary fieldwork in South India. Here I understand property as technical infrastructure that forms relationships between humans and environment. This paper argues that technical fixes do not merely solve an existing problem, but first constitute them discursively and materially (Fortun 2001). The coast of Chennai is a pluridiverse space where people hold multiple social relationships with the environment. Oceanic and beach commons are classic examples of resources which are not legally defined as taxable "property". In this context,

fixing property use through law involves the reworking of existing relationships into technical, and legalistic terms. This paper argues that technical fixes involving property also rework social relations and are politically fraught. This paper points to how technological fixes to climate change materialize in culturally specific ways.

Session Organizer:
Kean Birch, York University

167. Environmental Risks in Transnational Contexts I
Papers for Open Panels/Environmental Risks in Transnational contexts
Open Panel
9:00 to 10:30 am
ICC: E5.1
Participants:

A Study of the Cognitive Structure of Environmental Risk in China *chenggang zhang, School of social sciences,Tsinghua university,Beijing,China,100084*
Environmental risk cognition is the perception and psychological feeling of various affections which brought about by the Human-caused environmental change. Research on environmental risk cognition will contribute to an effective management of environmental risk. This paper reveals the public cognitive status of environmental risk in China, as a representative of newly industrialized countries. We explore the structure of public environmental risk cognition in a certain historical period, helping to table a proposal for environmental risk governance in the new period of China.

China's Social Drives of Environmental Technology Introduction: A Case Study of UASB in Beer Industry *Guo Qinshuo, Institute of STS, Tsinghua University, Beijing, China; Yang Jian, Institution of STS, Tsinghua University, Beijing, PRC*
The deepening of the reforms and opening-up of China in the 1980s witnessed a rapid increase of China's industries and environmental problems following it. Voices for environment protection from society made enterprises take their impact on environment into significant account. Introduction and R & D of UASB (Upflow Anaerobic Sludge Blanket) technology in China discussed in this article derived from the needs for of wastewater treatment of industries like beer whose activities became a severe threat of surrounding residents. Game playing between Tsinghua University and Beijing Brewery in the development of UASB reflected their different views of technological path. China's government had to mediate in this game to push the application of environmental technologies. The application of UASB not only solved environmental problem but also made this technology integrated by production system being an important part of green beer industry. Game playing between industry and school was the inevitable result of more social engaging. The history of China's technology could be assumed as a process of industry technology transforming into ecological technology. The introduction of UASB stood on the starting point of this transformation. Analysis of social dynamics of this process could be helpful to the understanding of evolution technology in an era of ecological civilization.

Environmental Public Interest Litigation In China : A Case of Environmental NGO "Friends of Nature" *Bing Liu, STS Institute, School of Social Sciences, Tsinghua University*

With the development of the construction of ecological civilization in China, the public participation in environment protection become a more and more important problem. In that background, environmental public interest litigation, both in theoretical investigation and practice, appeared in China too. However, in the earlier period of the development of environmental public interest litigation in China, there are still many problems and difficulties which need to be solved and overcome. In recent year, in China, practitioners of environmental public interest litigation are mainly the environmental NGOs. Friends of Nature is one of the oldest and fames environmental NGO in China, which initiated and participated some influenced environmental public interest litigation. Taking the case of Friends of Nature's participation of environmental public interest litigation, some related problems, such as qualification of the subject of litigation in China restricted by the new Environmental Protection Law in 2015, the restriction for NGOs in their development, the financial problems in environmental public interest litigation, and some related controversies in environmental ethics, will be discussed.

Culture of Skepticism:An Inquiry into the Socio-Political Life of Air Quality Digital Panels in Tehran *Raheleh Abbasinejad, 1991*

As the long-term and short-term health and socioeconomic impacts of air pollution have become more apparent, various air pollution mitigation plans and policies have come into the sharp focus of governments across the world. These policies, however, have had complicated and diverse outcomes in different areas, with levels of air pollution in especially socioeconomically disadvantaged countries remaining high and rising annually. Promotion of the public awareness about air pollution is one of those complicated plans that has been improved a lot over the years, and various governments have employed particular devices to disseminate air quality data. Therefore, making information on air quality data more accessible to the public has been one of the critical, yet less studied environmental projects, aiming at empowering citizens to take protective actions or actively engage in the air pollution control plans. Nevertheless, varying interpretations and evaluations of air quality information by people, coupled with the particular sociopolitical context of the air pollution in a city may compound to produce unexpected behaviors and perceptions that may serve to discourage rather than reinforce civic engagement. This paper, accordingly, seeks to explore lay people's engagement with the environmental risk information, and practices of compliance, ignorance, and resistance taken by citizens toward the devices of risk communication, principally air quality digital panels installed in Tehran, Iran. Providing ethnographic evidence, I critique the governmentality and related literature on risk communication by noting how people in my study did not simply govern their behavior in accordance with expert risk knowledge but, in fact, orient to risk information in different ways. The key findings of my analysis are how people in Tehran express skepticism over air quality data, which seems to be less about science than about the state-sponsored nature of the information and the environmental digital panels.

Session Organizers:
Wei Hong, Tsinghua University

Jian Yang, Tsinghua University
chenggang zhang, School of social sciences,Tsinghua university,Beijing,China,100084

168. Public Engagement in Science and Technology Policy 1
Papers for Open Panels/Public engagement in science and technology policy
Open Panel
9:00 to 10:30 am
ICC: E5.10

The massive promotion of certain emerging technologies and research fields is increasingly accompanied by measures that do not only observe and analyse a potentially unruly public, but also seek to mobilize and involve the public in the policy discourse. Deliberation and participation in technology policy, or simply "public engagement" (PE), is supposed to shed light on social and ethical aspects of future developments, to anticipate and defuse potential social controversies about these technologies, and render communication between decision-makers and the public more egalitarian and democratic. Participatory PE formats which have been developed to function as democratic and epistemic add-ons to established democratic procedures in specific national contexts have diffused into new national and transnational political-institutional contexts with new political and epistemic requirements and demarcations. This trend that is visible across the OECD and has brought about a wealth of social science theorizing and, often, the practical involvement of the social sciences in PE events raises several issues that will be examined by this panel. First, from a structural perspective, the following questions arise: which mechanisms explain why and how the trend toward PE manifests itself in different national political cultures? Is PE creating new epistemic and political demarcation lines between the public and the science and policy subsystems? Second, social scientists may be both the analysts and designers of PE events, and mediators between society and technology. How can the role/agency of the social sciences in PE processes be conceptualized? Which role conflicts or normative dilemmas arise from it?

Participants:

Are we talking to the public about emerging quantum technology? *Tara Roberson, Centre for Public Awareness of Science*

The messaging around quantum technologies is future-oriented and bold: the best-known application of the field – the quantum computer – has been subject to intensive promotion by researchers, governments, and industry. This messaging largely centres on a promise that quantum technologies will affect all aspects of society, from health and the environment, to security and the economy. International emphasis on the field has led to significant investment across the world from public and private sectors. Government-funded programs include the UK Quantum Hub Network (USD$400 million/five years), the European Union Flagship Quantum Program (USD$1.3 billion/10 years), and a USD$10 billion investment by China into a quantum laboratory in Hefei. Meanwhile, financial consultancy Morgan Stanley anticipates that the market for quantum computing could double in the next decade to $10 billion if the field continues on the current trajectory from theory to test phase and on to functional quantum computers. A study conducted by Sciencewise (2014) found no previous evidence of efforts to gather and report on public views and values in relation to quantum technology. Currently there is one visible attempt to mobilise and involve the

public in discussions around quantum technology – a Responsible Research and Innovation-based program led out of the UK's Networked Quantum Information Technologies project. In this context, are lay publics aware of the social and ethical aspects of development in quantum technologies? What does the emerging area of quantum technologies tell us about public engagement and what would quality public engagement look like in this space?

Constructing Public Engagement: Unexamined Assumptions In Framing Science And Technology Policy Problems *Christian Ross, Arizona State University*
Growing emphasis on public engagement as a component of policy discussions about emerging technologies raises questions about how public engagement has manifested with such prominence and what impact it has in configurations of the relationships between science, publics, and policymaking. However, these questions leave the ways in which public engagement has come to be constructed in particular ways unexamined. This paper aims to step back and interrogate the broader assumptions and values that underlie and contextualize the construction of public engagement. Taking a close look at the deliberative discussions around genome editing and public engagement, this paper argues that assumptions about the kinds of challenges presented by emerging technologies can constrain how public engagement becomes constructed in ways that privilege scientific ways of knowing over more democratic approaches, even when attempting to prioritize non-technical perspectives. By framing challenges of emerging technologies as fundamentally problems of sufficient and appropriate knowledge rather than problems of legitimate, deliberative processes, these discussions constrain solutions to be concerned with better understanding and not necessarily better practice. Public engagement, then, is constructed primarily as a knowledge generating enterprise rather than a legitimizing, democratic process. The distinctions in these constructions are highly consequential for the relationships between science and publics in policy discussions and how those discussions unfold.

Moving across national borders? The Europeanization of the Anti-Biotech Movement *Franz Seifert, University of Vienna*
The emergence of the EU has led to ambivalent expectations as to the viability of supranational democracy. In particular, expectations diverge as to the chances for the emergence of a European public sphere. Pessimists consider national fragmentation to be a major obstacle, optimists believe that transnational protest movements might bring about such a sphere. Contributing empirically to the debate, this study measures the Europeanization of the anti-biotech movement in the EU. It draws on a quantitative protest event analysis covering the period from 1995 to 2009 in Austria, France, Germany, Spain, and the UK, as well as in the sub-, supra- and transnational sphere (N = 1,865), and compares four pathways to Europeanization: domestication, externalization, supranationalization, and transnational pressure. It explains the relative prominence of these pathways by a general theory of movement behaviour based on transaction costs and contextual opportunities and the specifics of the EU's GM policy domain; and also examines alternatives to these standard predictions. While Europeanization is presented as a multi-level process entailing national, sub-, supra- and transnational arenas, nation states remain the key arenas of movement for Europeanization, which is reinforced by the contentious character of the GM policy domain. While grassroots actors show a certain tendency towards transnational activism, only well-resourced, professional actors exploit opportunities at all levels. In sum, the study lends support to the pessimistic vision that national fragmentation is a persistent feature of Europe's public space.

Public Engagement: The case of stakeholder committees in research organisations in France *Lucile Ottolini, INRA / INERIS*
This paper draws on the analysis of an institutional innovation: the creation of stakeholder committees in public research organisations. In France, this innovation dates back from the 2000's. The official objective is to open up the governance to members of the 'civic society' in order to increase research pluralism and to improve the alignment between 'societal needs' and production of scientific and technical knowledge. So far, such opening up has not been studied. As these stakeholder committees have now ten years experiences, successes and failures, the time is ripe to thoroughly analyse this institutional innovation. Can such committees influence knowledge production and orientations? Does it change the sociology of people involved in scientific decisions? What practices does it promote in scientific institutions? To explore those general questions, this paper pays attention "to rules and rule making" of stakeholder committees (Epstein 1998, Fischer 2000, Weisman 1998, Frickel & Moore 2005). Here we focus on specific rules: accreditation as a representative (people and organizations) – hearing (roles and knowledges) – file process – agendas setting – relationships to other institutional governance parts. Our comparative study draws on the analysis of 4 stakeholder committees settled as part of scientific governance in French expertise and research institutions in sanitary and environmental fields. Qualitative and quantitative data were collected by participant observatory, interviews and archival work. The results shows that public engagement is highly shaped by rules processes.

Session Organizers:
Franz Seifert, University of Vienna
Camilo Fautz, Institute for Technology Assessment and System Analysis (ITA)
Chair:
Franz Seifert, University of Vienna

169. Transgressing the Intersection of Science and Food I
Papers for Open Panels/Transgressing the Intersection of Science and Food
Open Panel
9:00 to 10:30 am
ICC: E5.2
Participants:
CRISPR and Food Production – Promise and Limitations *Val J Martin, Illinois Institute of Technology*
The discovery in 2012 of a new form of DNA modification based on the CRISPR method created a new field of research and opened new possibilities for genetic manipulation. One particular area was the changing of gene expression in crop plants and domestic animals. This

paper will briefly examine the history of this development and the debates which it has generated. In some respects these debates resemble previous ones about GMOs (genetically modifies organisms). But the sophistication of the new method makes the analogy limited, and actually opens new questions about approaches to food production and safety, and related ethical issues. This paper will discuss different narratives from various groups participating in these debates, including perspectives from research, policy-making, and social studies, as well as public concerns.

Don't Stress the Animal! Poor Animal Welfare and the Resulting 'Essence' in Meat *Emily Buddle, University of Adelaide; Heather Bray, The University of Adelaide; Rachel Ankeny, The University of Adelaide*

People are becoming increasingly concerned with how their food is produced, particularly with the rise of "big ag". The increased availability and sales of animal products with welfare claims have been linked to concerns about animal welfare. Through focus groups and interviews, we explored the attitudes of sixty-six meat consumers in Australia towards the concept of farm animal welfare. Participants of our research believed that if an animal is, what they consider to be as, poorly treated - whether on farm, during transport or slaughter - an 'essence' remains within the meat and can have an impact on the consumer. Such essence may be related to what they view as the un-natural feeding of grain to livestock or to the particular types of slaughter practices utilised. However, it is becoming increasingly apparent that attitudes towards what constitutes as "good" animal welfare differ greatly across the meat value chain. It is not a matter of whether such attitudes are considered as right or wrong - it is about how these attitudes are formed, influenced and shaped socially and culturally, and the impact they are having on the erosion of trust within the meat value chain. Without the consideration of such differing attitudes and dialogue between stakeholder groups, such as producers and consumers, conflict between attitudes will remain, with potentially dire consequences for the social license of meat producers and processors.

Farming and the oil and gas industry: a toxic mix? *Brian P Bloomfield, Lancaster University; Bill Doolin, Auckland University of Technology*

The existence of oil and gas reserves under prime agricultural land in the Taranaki region of New Zealand has brought the oil/gas and farming industries together in an often uneasy coexistence that requires new arrangements and accommodations. For those who challenge this concurrence, boundaries and their transgression assume particular importance – growing things on the land and extracting things from the same land represents a concerning and incompatible "cross-over". The bioremediation of waste from drilling and oil/gas production activities by its 'landfarming' on local dairy farms brings the issues underlying this tension to the fore. Opponents of the practice articulate a sense of category violation in which things that do not fit together, that are meant to be kept apart because of the danger of contamination, are illegitimately juxtaposed (Douglas, 1966). In contrast, oil and gas industry representatives and regulators argue for a more technocratic perspective that emphasises the procedures and technological

capabilities to contain and control the handling of waste to the mutual benefit of farming and the industry. Through a critical reading of publicly available texts, we analyse three moments of 'breakdown' in the technical and regulatory infrastructure governing landfarming in Taranaki: the discovery of contaminated well sites, stock grazing on recent waste disposal sites, and the possible contamination of milk tankers. The symbolically "dangerous material boundary crossings" (de Rijke, 2013) invoked in these instances have profound implications for the development and acceptance of this extractive industry in communities with an established identity based on pre-existing land use.

Marketing Superfoods at the Intersection of Science and Tradition *Jessica Loyer, The University of Adelaide*

Over the past decade, the former Aztec staple grain chia has rapidly moved from relative obscurity to the health food limelight via its "superfood" status. Superfoods owe much of their popularity to the interaction between science and tradition in superfoods discourse, as they are doubly verified as healthy by both nutritional science and indigenous wisdom. This paper explores the clash between, and melding of, Western and indigenous epistemologies regarding what constitutes health in relation to foods. It focuses on the overlaps and tensions between two prominent discourses in superfoods media, nutritional primitivism (Knight 2014) and functional nutritionism (Scrinis 2013), through examination of chia seed production and marketing, to reveal how these two seemingly competing discourses are co-constituted both in terms of how they inform research agendas and how they communicate food and health values to consumers. Drawing upon evidence from marketing, product packaging, and superfood books, I conclude that ultimately nutritional science retains its hegemonic position, as tradition only comes to matter in superfoods discourse as it is verified by science. This limits the effectiveness of superfoods to challenge scientised views of food and health and relegates traditional producers knowledge to a secondary position. These findings contribute to understandings of interactions between science and values in popular representations and perceptions of food and nutrition.

Session Organizers:
Rachel Ankeny, The University of Adelaide
Heather Bray, The University of Adelaide

170. Climate Technology and Climate Justice

Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: E5.3

With the advent of climate change, and associated transnational climate policy, it has become critical to develop a deeper understanding of the socio-ecological relations of emissions reduction. Climate technologies are often presented as technical solutions designed to reduce the emission of greenhouse gasses. But they are also social technologies, conditional upon social and political legitimacy. The concept of a stable climate itself is socially defined, as any rise in global temperature produces social injustice. The purpose of the technology is framed by definitions of justice, reflecting its socio-ecological logic. Its success depends on social legitimacy. What, then, are the social preconditions for climate technologies? How may emission-reduction require broader social transformations, and how can climate technology

enable this? What is the relationship between climate technology and climate justice?

Participants:

Energy and climate change in India, Germany and Australia: a comparison in the social legitimacy of renewable energy *Devleena Ghosh, School of Communication, Faculty of Arts and Social Sciences, University of Technology Sydney; James Goodman, University of Technology Sydney*

A key outcome of the Paris Agreement is that 'intended nationally-determined contributions' for decarbonisation are to be implemented across the globe, with 'successive' and intensifying commitments post-2020. However, the conditions for decarbonisation vary dramatically both within and across high-income 'post-industrial' and low-income industrialising countries. This paper compares the social relations of electricity generation in India, Germany and Australia to better understand and theorise the different preconditions for decarbonisation and adoption of renewable energy. It draws on recent climate and energy policy documents in the three countries to help understand the emerging relationship between climate technologies and social justice. It explores the dominant socio-ecological relations of energy production, distribution and consumption in India, Germany and Australia. How are these relations being changing with the increasing reliance on renewable energy? What are the implications and prospects for strengthened social legitimacy of renewable energy in the three countries?

A 'new agenda' for solar energy in India? *Manju Menon, University of Technology Sydney; Kanchi Kohli, Centre for Policy Development, New Delhi*

As the largest democracy and the fourth largest emitter of global carbon emissions, India faces moral pressure and an unprecedented opportunity to decarbonise its domestic energy system. Three policy documents mark the government outlook towards domestic energy production in light of climate change concerns. The draft National Energy Policy of 2017 sets a "new agenda" while the Solar Energy Policies of the state governments of Rajasthan (2014) and Telangana (2015), lay out a roadmap for achieving the ambitious national renewable energy targets. Through a review of these documents along the themes of transparency, public participation and justice, the paper concludes that a continued democratic deficit in energy governance can delegitimise and derail the ambitious renewable energy targets as well as the national energy policy as a whole.

Energy Transformation as a Social Process: Post-Coal Politics and Energy Transition in Eastern Germany *Tom Morton, University of Technology Sydney*

The German Energiewende or energy transition has been described as "one of the most ambitious national energy transition initiatives worldwide" (Moss et al, 2014, 1) – an ambitious suite of policy measures which aims for full decarbonization of the economy by 2050 and a transition to an energy system in which energy supply is almost fully based on renewable energies (Matthes 2015). However, the Energiewende is not simply a set of technological solutions and policy instruments, but also a social process. This paper builds on a local ethnography of the Energiewende conducted in 3 villages in Lusatia (Eastern Germany) from 2014-17, in which the energy transition has become integrated into the fabric of rural life. The villages are threatened by an expanded coal mine, and the paper analyzes the motivations and mentalities underlying the villagers' commitment to the process of energy transition. It suggests how this analysis might inform the process of structural change and energy transition underway at a regional level in the state of Brandenburg.

Mapping a Laggard: Climate Policy Networks in Australia *Francesca Da Rimini, University of Technology Sydney; Pradip Swarnakar, ABV-Indian Institute of Information Technology & Management, India; James Goodman, University of Technology Sydney*

As a resource-rich country, Australia is heavily dependent on coal and gas: ninety percent of electricity is produced by fossil fuels and energy accounts for a third of commodity exports. The Australian Government has been a persistent laggard in climate policy. In 1997 Australia was one of three industrialised societies to negotiate a rise in emissions as part of its obligations under the Kyoto Protocol. More recently the Australian Government has strongly promoted Australia as an energy export platform, especially for coal and gas. In climate policy Australia now bucks the global trend: in 2015 the Grantham Institute's Global Climate Legislation Survey described Australia as 'the first developed country to take a legislative step back from acting on climate change'. This paper investigates what is distinctive about Australia's climate policy-making networks, to help explain its stance. The paper reports on an Australian component of the 18-country 'Comparing Climate Policy Networks' study. It analyses the results of survey and interview-based research in order to map the main influences on Australian climate policy-making. The paper compares these results with parallel investigations in other countries, seeking to account for variation.

Civil Society and the Climate Change Movement in India: A Critical Evaluation of Development-Environment Dialectic from Rio to Paris *Ruchira Talukdar, School of Communication, Faculty of Arts and Social Sciences, University of Technology Sydney; Pradip Swarnakar, ABV-Indian Institute of Information Technology & Management, India*

India holds a dual position in today's global climate politics. On the one hand India is a major contributor to carbon emissions, and on the other it is a developing economy with low per capita and historic emissions. In climate debates, India positions itself as a developing nation with an urgent need to meet the basic needs of its citizens. The "right to development" narrative has been strengthened with the idea of "common but differentiated responsibility." Therefore, the concept of climate justice has had a predominantly outward focus towards global equity. Against this backdrop, our paper aims to identify critical civil society narratives on climate justice and their movements against national and international actors. To examine the dynamics of the climate movement in India, we focussed on the period from the Rio Earth summit to COP21 in Paris. Employing the conceptual framework of "climate-dialectic," we critically evaluated significant networks and mobilisations around climate change, or other related movements whose impact may be attributed to mitigating climate change. We found that most movements initiated as local resistances to protect livelihoods and human rights of communities, although anti-coal and anti-dam projects were also likely to impact

the debate. In conclusion, we have highlighted that unlike Northern countries, India lacks a grand narrative on climate change movement mobilized by transnational environmental non-governmental organizations. Instead, the Indian movement can be regarded as a mosaic of dispersed mobilisations that challenge the deleterious effects of development, from which common themes for an emergent climate justice debate can be drawn.

Session Organizer:

James Goodman, University of Technology Sydney

171. States of Matter/Matters of State: Amphibious Scholars in Technoscientific Space

Papers for Open Panels/States of matter/matters of state: Amphibious scholars in technoscientific space
Open Panel
9:00 to 10:30 am
ICC: E5.4

This session explores what matters and comes to have matter in the current atmosphere (taken both as the ambient medium of air and as the omnipresent mood of the volatile and uncertain political present). Through the presentations, we move from the depths of the earth, sphere by sphere, to the boundless envelope of air and the digital, and explore our habits and habitats through and in various mediums. The panel speaks to the different epistemologies, processes, objects, and relations that unfold in media, as spaces that represent ensembles of nature and culture. We hope to open conversational room to outline a pragmatic contextualist environmental ethic in STS with which we can approach different physical and conceptual spaces.

Participants:

Ambient Order and Topologies of Air *Aftab Mirzaei, York University STS*

Throughout his work, Michel Serres asserts that different periods of history are not defined by transformations between elements but instead, by transformations between different states of the same element. Serres suggests that the dominant state of matter in the contemporary Anthropocene has changed phase from the solids of classical physics, to a fluid flux exemplified in Bergson's philosophy, to the gaseous transmissions of information technologies. In paper, I want to explore how the current atmosphere (taken both as the ambient medium of air and as the omnipresent mood of the volatile and uncertain political present) makes for the materialization of different states of matter and matters of state, in scholarship and polity alike. This provocation frames the global, national and local, as well as the social, technical and cultural, as co-evolving topological systems and surfaces capable of behaving spatially—thus as capable of having atmospheres. In this context then, I want to explore how these spaces are changing by the digital matter that passes through them. What sort of spaces unfold at the global and local levels, as our rhetorical situations become rearranged alongside new radiant objects? In other words, how do we, as scholars, attune our senses, or become amphibious in this now chimerized air that is imbued with digitality? To this end, in this paper, I will use intelligence as a thinking object to consider how we can come resolve the global and the local in digitally attuned scholarship.

Revisiting Matters Cryptography in the Atmosphere of (Post-Cyber-)Feminist Technosciences *Anastassija Kostan, University of Mainz/ University of Frankfurt Germany*

Feminist STS is working with "material conditions", "material states" or "material practice" while claiming to intertwine (critical or post-)humanities with sciences. Through a genealogy that explores the development of "matter" in the works of Vicky Kirby who provides a "corporeography" of matter and Elizabeth Grosz who gives a "new idealist" account of mind and form, I want to examine the role of language(s) in the atmosphere of neomaterialist (post-cyber-)feminist technosciences. There is very diverse knowledge about "matter/ materialization/ mattering" that is circulating internationally in scholarship, and it is not yet systematized what it means to say "matter." Since the very first ages of philosophy "matter" was conceptualized and re-conceptualized in manifold manners, the lately performed "material turn" claims to give it another try. Driving from the heritage of (largely Australian) feminist theory, neomaterialist concepts of matter mutate and transform older views of matter especially from Europe that are determined by division and difference, binaries and dichotomies. As a traveling concept in the STS, matter is theorized as spectra of processes and dynamisms that are expressed within different forms of decentralizations, digital and physical relational entanglements that aim to free knowledge production from hegemony, gender, essentialism and anthropocentrism. But it is also worth looking at the mediative role of the investigative apparatus – language(s)/ cryptography/ incorporeality – STS is operating with to restock neomaterialist feminist technoscientific enquiry.

The Verticality of Drilling: Construction, Destruction, and Disturbance *Eric Kerr, National University of Singapore; Malini Sur, Western Sydney University*

This paper probes how drilling's capacity to disturb, destroy, and construct reorganizes ecological and social relationships. Drilling unfolds many possibilities - for extraction, construction and infrastructure. We explore drilling by honing in on two slices of verticality. Extending our understanding of what Michael Watts calls a "science of the vertical" comprised of a "landscape of lines, axes, hubs, spokes, nodes, points, blocks, and flows," we track not only below the surface but also above, into the terrestrial crust and the atmosphere. These include changing methods and techniques for directional drilling and wellbore navigation, the design of drill bits, networks of data processing and interpretation, geological surveys, and rapid landscape transformations. We argue that drilling's capacity to enable possibilities is undermined by the ground and its affordances. By exploring the differences and similarities between above and below-ground drilling we show drilling's importance beyond the engineering and construction industries. Finally, we look at how what may ordinarily taken to be by-products of these processes - rubble, broken tools, and soil - are constitutive of drilling, exceed it and are brought into a reserve of techniques and means. Drawing on our fieldwork in offshore oil rigs and construction sites, our contribution argues that the lines between extraction and construction, resource and debris, and the ground and the artificial are porous.

Seeing Through Rocks: Rare Earth Elements in Media History *Zane Griffin Talley Cooper, University of Pennsylvania, Annenberg School for Communication*

Since Welsbach's incandescent gas mantle in the 1880s, which illuminated households and city streets both before and after the proliferation of Edison bulbs, rare earth minerals have maintained pivotal roles in shaping and conditioning how we see and hear the world. And as our media consumption has become more personal, our relationships to rare earths have become more and more pronounced. Rare earths have afforded and enabled many of the transformations in modern media technology, yet thus far have elided significant mention in the annals of media history. A proper empirical history of rare earth minerals in media has yet to be written, and this study hopes to fill that crucial gap. Since 2010, it has become relatively widely known that, to a large extent, rare earths power our digital world; Yet, these enigmatic metals have long played key roles in shaping our relationship to mediated sight, sound, and information. This paper will explore the journey of rare earths through media in the 20th century, from carbon arc lamps in cinema projectors and coated optical glass, to europium phosphors in cathode-ray tubes for color TVs, and samarium magnets in the original Sony Walkman. Through this endeavor, I seek to better understand how modern media technologies have developed alongside and within changing regimes of mineral extraction, mapping this media history onto shifting political hegemonies of rare earth exploitation - from India, to the United States, to China - to show how resource politics are inextricably entangled with media futures.

The dark synthetic sky: flying and dying in the analogue atmospheres of flight simulation *Peter Hobbins, The University of Sydney*

Throughout the 1930s, pilots were blamed for 80% of aviation accidents. One response was the introduction of flight simulators. Developed from early servomechanical units, by the 1950s new Dehmel-type simulators comprised sophisticated human-machine interfaces at the vanguard of analogue computing. Yet all but the most elaborate installations lacked visual projections. Aircrew instead 'flew' beneath opaque or translucent hoods, imaginatively traversing a dark synthetic sky. This absence of visual stimuli disciplined flyers into obeying their instruments and radio signals (Jeon, 2015). As closed-world environments idealising man-machine integration (Edwards, 1996; Ghamari-Tabrizi, 2012), simulators recursively gamed routine missions while leaching affect from ersatz crisis scenarios (Crogan, 2011). Indeed, the early 1960s saw simulator hours endorsed as surrogates for 'real' cockpit time, while mastering their synthetic missions was considered more demanding than most operational flights. Yet with pilots now held accountable for just 50% of crashes, escalating simulator use highlighted human fallibilities. From the earliest models, aviators' shortcomings were captured by the recording devices integral to simulator installations, habituating aircrew to forensic monitoring well before 'black boxes' were mandated aboard airliners (Siegel, 2014). By 1970, these accusatory flight-data traces again saw pilots blamed for 80% of crashes. Simulators were thus complicit in the technological appropriation of airborne agency, diminishing perceptions of human capability and accelerating demands for automation. Triangulating aircrew performance studies (Holmes, 2014), the 'software-simulated airworld' (Budd and Adey,

2009) and the 'dronification of state violence' (Shaw, 2014), this paper historicises the role of flight simulators in emptying the skies of human agents.

Session Organizer:
Aftab Mirzaei, York University STS

172. Data Worldings and Post/colonial Connectedness I

Papers for Open Panels/Data worldings and post/colonial connectedness
Open Panel
9:00 to 10:30 am
ICC: E5.5

Data infrastructures are producing unprecedented amounts of data and figures, advancing a primarily data-based understanding of worlds and compelling the coming together of different rationalities, imaginaries, economies and agencies in the pursuit of ever more integration across and connection between data. We suggest that current desires to apprehend a totalised world at all scales—including bio- and atmospheres, cosmos, inner spaces and outer surfaces of bodies—exclusively through data need to be understood as constituted in and through colonial relations and their shifting material realities. STS-inflected scholarship on data and data infrastructures has provided useful insights into making, sharing and mobilisation of data as efforts to govern the furthermost reaches of the "natural empire" (Bowker 2000) and into their participation in racialising asymmetries. With this panel we wish to further problematize emergent data worldings drawing on postcolonial critiques of the "universal" and "global" to examine how data worldings are contingent on and enact specific colonial relations. We also want to explore how attending to data worldings can help us understand the ongoing unfolding and transformation of neo-colonial logics and practices. How are data infrastructures entangled with and re-shaping colonial territorialities and histories? In what ways do data practices rely on the re-iteration or distortion of heterogeneous registers of colonial power, like expansion, standardisation, assimilation, aggregation and discrimination? Helping to contextualise these issues within postcolonial theories is our discussant, Dr. Fiona Lee, an expert in postcolonial studies from the Department of English at the University of Sydney.

Participants:

Data compositions and imperial formations *Antonia Walford, University College London; Tahani Nadim, Museum fuer Naturkunde*

In this paper we want to attend to "data compositions" - the ways in which digital data are put together as well as objectified - and how they are embedded in or intersect with what Ann Laura Stoler calls "imperial formations", ongoing and implicit processes of devastation "defined by racialized relations of allocations and appropriations" (2008). How are data infrastructures entangled with and re-shaping colonial territorialities and histories? In what ways do data practices rely on the re-iteration or distortion of heterogeneous registers of colonial power, like expansion, standardisation, assimilation, aggregation and discrimination? Might these data processes figure new qualities and intensities of the colonial as e.g. "data colonialism" (Thatcher et al. 2016)? To what extent are current data collection projects steeped in the logics of imperial explorations and travels? Do novel data compositions continue the colonial classification complex and the idea of number as an instrument of colonial control (Appadurai 1993)? How can we reconstruct the theoretical categories which govern data worldings in

relation to historical interconnectedness? How can data worldings allow for what Verran (2002) calls "postcolonial moments" that disrupt unequal distributions of power, resources and agency? Based on empirically-grounded reflections on data compositions from our respective fields, the Brazilian Amazon and the natural history museum, we suggest a number of problem spaces and heuristic devices which help figure and give form to the intersections of data compositions and imperial formations.

Building a National Criminal DNA Database: Spectacle and Routine in a Postcolonial African Data Worlding *Noah Tamarkin, Ohio State University*

Based on ongoing ethnographic research in South Africa, this paper considers the intersection of forensic genetic information technology and the postapartheid state. In January 2015, South Africa enacted a new law that mandated the creation of a national criminal DNA database, and that tasked the South African Police Service with building it. This was a controversial law that was debated primarily in terms of the potential for violation, and in particular the potential for police corruption that might result in convictions of innocent people. But it was also envisioned by many as a way to bring South Africa up to date with global technologies. Three years later, the building of data infrastructures is well underway. Moving beyond the debates' negative framings of African corruption verses African belatedness, this paper considers the ideas of the national, the global, and the postcolonial that now inhere in the active work of building South Africa's national criminal DNA database. It takes up two sites in particular. The first site is a site of spectacle: a "high profile" case involving a young white man accused of murdering most of his family. The second site is routine: the everyday work of police officers on patrol as they make decisions about what kinds of cases and what kinds of evidence to pursue and how. Between spectacle and routine, a data worlding comes into focus that can shed light on the contemporary stakes of this data infrastructure, and the historical legacies that shape it.

'Smart cards for all': the digitalisation of universal health coverage in India *Marine Al Dahdah, Cermes3*

In less than ten years, India has launched colossal biometric databases. One among them is related to the first 'free' health coverage scheme offered by the government of India: the Rashtriya Swasthya Bima Yojna (RSBY). Based on a public-private partnership between government and private companies, RSBY national scheme was launched in 2008, as a first step towards universal health coverage in a country where households endorse 70% of health expenses. The first phase of RSBY offers to cover 30,000 rupees ($600) of inpatient expenses per year for five members of a below poverty line household and is now piloted in several Indian States to include outpatient expenses and above poverty line families too. RSBY relies exclusively on a centralised digital artefact to function, made visible by the "RSBY Smart Card", a chip enabled plastic card containing personal data of individual and their family counting and conditioning the granting of health services to them; thus, no smart card means no health coverage. Till date 120 million Indians have been registered in the RSBY database. This paper analyzes how health accessibility is crafted under the RSBY scheme by questioning two

central dimensions of this data-driven digital health scheme: the smart card technology and the public-private partnership. Whereas RSBY scheme promises health coverage for all, its digital infrastructures may complicate access to health services, and reveal new patterns of exclusion of individuals. Thus, we will detail how smartcards technologies and private providers condition access to healthcare in India.

The United Nations Population Fund, Data Infrastructure, and Demographic Worldings *Carole McCann, UMBC*

Extending the analysis developed in my 2016 book, Figuring the Population Bomb (University of Washington Press), and 2017 Feminist Media Histories article in their special issue on the history of data (Vol. 3, No. 3), this paper traces an early example of data worlding: the development of the global population data infrastructures in the mid-twentieth century through the United Nations. Centered on the figurations of India's 'exploding' population by the network of US demographers who built the global population data infrastructure, the paper interrogates the "historical yet enduring imperial relations" and logics that brought global population statistics to life. It illuminates the intertwined statistical techniques, political contingencies, and affective associations in the measurement aggregation practices that compiled population forecasts. In so doing, it illuminates the reiterated racializing colonial logics of British accounts of India's 'natural patterns of birth and death' inscribed by official population statistics. Decennial population forecasts, which herald ever greater billions of people, informed global debates about population control and economic development throughout the twentieth century and are incorporated in the UN millennial goals. The paper concludes that although competing colonial/anticolonial readings of population figures shaped contentious debates about the meaning and value of population growth, the coloniality of demographic standards, infrastructure, and institutions that produce global population data continue to identify fertility reduction in the Global South as critical to achieving global population stabilization.

Session Organizer:
Tahani Nadim, Museum fuer Naturkunde
Chair:
Antonia Walford, University College London
Discussant:
Fiona Lee, The University of Sydney

173. Messing with Methods in More-than-Human Worlds III
Papers for Open Panels/Messing with Methods in More-than-Human Worlds
Open Panel
9:00 to 10:30 am
ICC: E5.6

A multitude of political, technoscientific and ecological disruptions are challenging the 'myth' of human exceptionalism, forcing researchers to find new ways of understanding, and intervening in, a range of human/nonhuman encounters. From reconfigured definitions of 'agency' and the 'social' to renewed explorations of 'co-presence' and 'mutual becoming,' more-than-human approaches can exemplify Donna Haraway's invitation to 'stay with the trouble' of human/nonhuman entanglements. But actually doing this research is hard. There is still a tendency, as David Abram puts it, to speak "about such entities only behind their

backs," instead of actively calling out and listening to them. And when we do succeed with that task, we still face the challenge of how to (re)tell these stories, or even trickier, how to 'take action.' This 3-part session provides a space for a collective, transdisciplinary effort to consider these methodological possibilities and limitations, and to share even our messiest experiments in creating and communicating knowledge necessary for thriving in more-than-human worlds.

Participants:

Researching the agency of micro-species in domestic hygiene practices *Rachael Wakefield-Rann, University of Technology Sydney; Dena Fam, Institute for Sustainable Futures, University of Technology Sydney*

Indoor domestic environments, particularly in urban areas, have increasingly been linked to adverse health conditions, including allergies (Godish 2016), diabetes (Chevalier et al 2015), developmental issues and certain cancers (Gore et al 2015). This research has identified that types of 'micro-species' (Wakefield-Rann et al, 2018) that occupy home environments significantly influence these health outcomes. The term micro-species denotes both the microbial and chemical species (Shapiro & Kirksey 2017) which interact with one another, materials and bodies to form the 'micro-ecologies' of homes. Our research sought to examine how practices enacted to create 'hygienic' home environments in Sydney, Australia have structured, and are structured, by interactions between micro-species. Data was collected through activity diaries, semi-structured interviews and enacted demonstrations of practices in participants' homes. Our findings revealed that microbes have become uniquely 'visible' to research participants through sensory proxies and collective, cultural cleaning practices. However, their assumptions about microbial agency embedded in their cleaning practices, often did not correspond to how microbes actually behave. The role of microbes as mutually dependant co-constituents of human bodies has been obscured by narratives and practices that define them as separate 'germs'. Moreover, findings indicate that the germ-centric 'regimes of perceptibility' (Murphy 2006) observed not only make the agency of chemical micro-species less visible, but contribute to the proliferation of harmful chemical exposures in homes through cleaning products. To enable ourselves to better 'hear' micro-species, we suggest a transdisciplinary research approach that incorporates participatory design in addition to biological and social science inquiries.

Messing with Paint: Toward an Etho-Ethnography of Artistry in Animal Sanctuaries *Jean M Langford, Univ. Minnesota*

Ethnography in interspecies animal communities necessitates dialogue with ethology, considered to be the default scientific authority for representing animal thoughts and actions. Ethological methods are valuable in encouraging ethnographers to attend to nonhuman animals themselves and not simply to human perceptions of these animals. Ethology can have the effect, however, of implicitly marginalizing the knowledge of human non-scientists (e.g. caretakers, trainers, and farmers) living intimately with other animals, and thereby overlook homegrown epistemologies, encompassing methods of speculation, empathy, and interspecies play. Ethology also offers few methodological strategies for addressing idiosyncrasy, species non-normativity, historically quirky interspecies encounters, and unique instances of

creativity. How then might we expand on etho-ethnographic methods to study the creativity of species-anomalous animals such as nominally wild animals living in captivity? This paper draws on Law's call for a method valuing beauty, Despret's and Lestel's respective contemplations of the possibility of animal art, and Grosz's ideas about the superfluous playfulness of life itself, to create an ethnographic account of the artistry of parrots and chimpanzees living in North American sanctuaries. While animal artistry is explicitly encouraged in the sanctuaries as a form of "enrichment" involving paint, brushes, and paper, it also extends beyond painting into everyday acts of animal liveliness that implicitly question a Eurocentric separation between aesthetics and subsistence. What ethnographic practice might be "response-able," in Haraway's sense, to captive animals' artistry? How might a participatory-observant method engage "response-able" speculation to experiment with the affective and imaginative dimensions of more-than-human ethnography and of animal artistry itself?

Re-imagining urban bird-human relations in South East Australia *Miriam Potts, Victoria University, Melbourne, Australia*

In this paper I respond to Kirksey and Helmreich's (2010, p. 558) call to investigate species flourishing and struggling in the Anthropocene. In these 'urgent times' (Haraway 2016) it is important to reconsider human relations with animals (Rose 2015) for 'earthly survival' (Terranova 2016). Building on Haraway (2003), my research begins with domestic companion bird-human relations (including relations with technology). By asking, 'What matters to a pet bird?', I begin to work with my companion bird, following his interest in relating to other parrot species, expanding our research to bird-human encounters in urban areas in south-eastern Australia. The bird and I establish kinship between species. Methodologically working across the fields of the environmental humanities and animal studies, I include emergent feminist artistic practices to disrupt the dominance of language. References Haraway, D. (2003). The Companion Species Manifesto: Dogs, people, and significant otherness (Vol. 1). Chicago: Prickly Paradigm Press. Haraway, D. (2016). Staying with the Trouble: Making Kin in the Chthulucene. Durham: Duke University Press. Kirksey, S., & Helmreich, S. (2010). The emergence of multispecies ethnography. Cultural Anthropology, 25(4), 545-576. Rose, DB. (2015). The Ecological Humanitites. In K. Gibson, DB. Rose, & R. Fincher (Eds.), Manifesto for Living in the Anthropocene (pp. 1-5). New York: Punctum Books. Terranova, F. (2016). Donna Haraway: Story Telling for Earthly Survival, Environmental Film Festival Australia (17 October 2017). Melbourne, VIC.

Flora and Fieldwork: Methodological and Theoretical Challenges in the Study of Plant Ontologies *Sophie Chao, Macquarie University*

This paper explores how indigenous Marind in West Papua conceptualise the socio-environmental transformations caused by monocrop oil palm expansion. Within the 'ecology of selves' (Kohn 2013) of the Marind lifeworld, oil palm is considered a particular kind of person, endowed with distinctive agencies and affects. The plant's unwillingness to participate in symbiotic socialities with other species jeopardises the wellbeing of

the forest and its human and other-than-human constituents. Drawing from ontological theories and the multispecies approach, I demonstrate that assumptions of human exceptionalism come under question in the context of a vegetal being that is exceptional in its own particular and destructive ways. At the same time, I emphasize that indigenous Marind theories of reality about oil palm are far from singular or static. At once agent of destruction and victim of human exploitation, the plant's ontology multiplies across divergent and contested forms of 'situated knowledges' (Haraway 1988). I explore the epistemological, ethical, and methodological frictions that arise in combining ontological approaches and multispecies ethnography towards understanding the lifeways of other-than-human species, like oil palm, that are 'unloving' rather than 'unloved' (van Dooren & Rose 2011). I offer the concept of 'dispersed ontologies' to highlight the entanglements through which such multispecies realities come into being, but also the limits in our capacity to inhabit vegetal worlds. I invite a concomitant practice of epistemic dispersion in STS research, which strives to cross-pollinate theories of reality across diverse fields, actors, and institutions, towards a non-unitary vision of other-than-human existence.

Session Organizer:
Larissa Hjorth, RMIT
Chair:
Anne Galloway, Victoria University of Wellington

174. Governing Toxic Waste 1
Papers for Open Panels/Governing Toxic Waste
Open Panel
9:00 to 10:30 am
ICC: E5.7
Participants:

Burying radioactive waste deep into the earth: nuclear safety policies from an international and socio-historical perspective *Tania Navarro Rodriguez, Université Paris Descartes*

The management and disposal of nuclear waste became a main issue for nuclear countries in the 70s, when nuclear industry development brings along a huge increase of radioactive waste. In some countries, the government established as a condition to continuing with construction of new nuclear power plants, the demonstration that a safety solution already exists to the disposal of radioactive waste. Especially concerning highly radioactive waste. This type of waste is particularly hazardous to humans and the environment for hundred of thousands years. In a context of important environmental and anti-nuclear movements, many countries consider deep geological disposal as a reference solution to the disposal of highly radioactive waste. This paper aims to examine how nuclear safety policies of deep geological repositories had been constructed at the international level. Considering geological repositories as safety infrastructures, this study takes into consideration the different spaces where nuclear safety expertise of deep geological repositories is producing and audiences for which it is carrying out. My argument is this expertise contributing to national's waste management policy-making processes. French case will be introduced in order to illustrate it. This research work mobilizes a varied of empirical material: interviews with

international experts, NEA's historical records (1970-1990) and NEA and IAEA's publications.

Invisible waste. Governing past uranium mines in France. *Brice Laurent, Ecole Des Mines De Paris; Julien Merlin, Mines Paristech; Yann Gunzburger, Ecole des mines de Nancy*

Extractive industries produce many kinds of waste, some of them produced through chemical transformation processes, and others set aside during mechanical extraction activities. In France, the classification of these waste has important consequences, as some of them are considered « industrial waste », and others « mining waste », and are covered by different regulatory texts. This distinction has been even more problematic in the case of the many uranium mines scattered across metropolitan France. These mines are not longer operating, and are currently being managed by a state-owned private company that specializes in uranium extraction and transformation. This paper draws on an empirical fieldwork related to controversies about the management of former uranium mines in France and the definition of their associated waste, in which government bodies, private companies, and civil society groups are involved. These controversies relate to what counts as « waste », what it means to be « nuclear », and how these categories are sustained by regulatory and material processes. By delineating the controversial regulatory and material circulation of waste across mining sites in France, and the various problematizations of uranium residues that emerge from public confrontations between the private company and its stakeholders, we show that current debates about the former France uranium mines can be understood thought an analysis of the politics of categorization. For whom these categories matter and how they map onto various forms of exposure to uncertain radioactive risks are then pressing issues for understanding the political economy of former mining activities.

Governing Nuclear Waste: What Should Be the Roles of National Regulatory Bodies? *Céline Parotte, University of Liege - Spiral*

In most nuclear countries across the world, geological disposal appears as the main option to manage high-level radioactive waste. Many new socio-economic, technical and safety issues arise with the implementation of this option. In the process of addressing these issues, national regulatory bodies stand out as crucial actors. While descriptions of their legal responsibilities abound, studies investigating the future normative choices emerging with the governance of toxic waste are needed. What should be the roles of regulators in dealing with the very sensitive siting process? According to whom? What does it mean for the credibility of the siting process? This presentation aims at systematically comparing three different regulation regimes and infrastructures of high-level radioactive waste management, based on actual perceptions of nuclear stakeholders of how, when and on what should national regulatory bodies intervene. Collected empirical data include a combination of empirical materials—i.e. legal requirements, safety case reports, participatory observations of consultation processes, 82 semi-directive interviews with policy makers, nuclear waste agencies, nuclear regulators in France, Belgium and Canada and local actors such as members of local information and monitoring council

(CLIS) and members of the community liaison committee of four volunteer collectivities (CLC).

Ruination Science: Producing knowledge about toxicants from the rubble of Chilean regulatory science *Sebastian Ureta, Universidad Alberto Hurtado*

Most conventional analyses on the practice of science in developing countries tend to criticize the precariousness surrounding the whole endeavor. As a consequence, scientific knowledge on such locations tends to be substandard, greatly diminishing its potential to deal with several complex issues affecting such societies, especially environmental degradation due to industrial waste. In recent years a growing body of STS-inspired research has been trying to overturn such narratives, seeing them mostly as just another manifestation of colonial valuation practices. Nonwestern environmental science, they argue, should be analyzed as having its own logic and achieving its own results, some of them quite unexpected from the outset. This paper aims to contribute to this task by analyzing material collected by the author while carrying out ethnographic fieldwork on CENMA, an environmental science lab located in Santiago, Chile. Established with foreign funding shortly after the return of democracy in 1990, CENMA was posed to become the main location for the practice of state-of-the-art regulatory science on toxics-related issues. However, two decades of political neglect and continual budget cuts, has left it on a state of (almost) terminal ruination. Through the analysis of practical vignettes, the paper argues that such situation should not be seen solely from a critical point of view. Ruination science, such as the one practiced at CENMA, tends to be messy, warm and ethically entangled, always on the look for alternative, highly case-specific, methods to answer environmental concerns. Especially in locations crisscrossed by multiple kinds of toxic degradation, frequently ruination science appears as much more able to deal with local issues than standard western-style science. Times of ruination, it seems, call for ruination science.

Session Organizer:
Tania Navarro Rodriguez, Université Paris Descartes
Chair:
Soraya Boudia, University Paris Descartes
Discussant:
Roopali Phadke, Macalester College

175. Mobilizing Identities, Digital and Otherwise
Closed Panels
Traditional (Closed) Panel
9:00 to 10:30 am
ICC: E5.8

National digital identity infrastructures have been in the news lately. Whether it is India's mammoth Aadhaar project, or more modest systems being deployed elsewhere, these recent attempts at building ID infrastructures have forcefully brought age-old questions of national identity and belonging to the digital realm. In our paper/panel, we examine how national digital identity systems in different geographies have attempted to pin down the slippery notion of identity to specific ID artefacts, to what extent they have been successful and with what implications for the owners of the ID artefacts. We explore these questions using our recently concluded and ongoing study of the case of Syrian refugees in Lebanon, non-citizens in Cote d'Ivoire, and domestic migrants and the homeless in India. By focusing on cases where people's

identity as a resident/non-resident, migrant/local, citizen/foreigner fundamentally shapes their everyday lives and ability to earn a livelihood, we hope to deepen the concepts of legibility and governmentality in a digital era (Foucault et al 1991; Scott 1998). While states have long attempted to create legible, manageable populations, we ask how the particular technologies being used in present times have allowed the state to "see" more or differently, and altered a population's ability to shape what is being seen of it. Our cases also deepen the idea of "infrastructural orphans" by following the plight of those who infrastructures cannot see (Edwards et al 2007) Thus, we contribute to STS' core interest in the working of human-technological assemblages by focusing on how states and populations learn to use different techniques and technologies to negotiate legibility in the context of newly deployed identity infrastructures across the globe.

Participants:

Identifying migrants: The case of digital biometric identity in India *Bidisha Chaudhuri, International Institute of Information Technology Bangalore*

When Aadhaar, one of the world's largest digital identity infrastructures, was rolled out in India, its proponents claimed that unlike other ID systems, it would make provisions to people without any prior identity proof, including populations such as the homeless, slum dwellers, and migrant labourers. This was to be done through the 'introducer system' (introducer to be appointed by the Registrar) for those who did not have any other ID. However, in reality, migration and lack of address proof have been identified as among the biggest challenges in acquiring an Aadhaar number. Migrant labourers often lack these prerequisites (such as a fixed mobile phone number and address proof). This paper focuses on the migrant/local continuum of identity to explore legibility from the state and the migrant's positions. To what extent has making migrants legible been a concern for the state and how digital ID systems have been leveraged to that end. At the other end, in what circumstances do migrant workers choose to be legible to the state and how do digital ID systems, such as Aadhaar, affect that choice? In addressing these questions, I look at identity as a sociotechnical category to understand the intertwined relationship between identity, politics and technology.

Infrastructure and the Power of Elites: Repair as a Hidden Dimension of Inequality *Christopher R. Henke, Colgate University*

Industrial modernity features infrastructures in almost every setting for human life, including energy, communication, food and water, transportation, and many others. In this paper, I argue that the design and ongoing control of infrastructural materiality is an important source of social power, and that the maintenance of sociotechnical systems is also an essential, if often hidden, means of reproducing power. This infrastructural repair helps elites maintain control over the sociotechnical systems that are often at the center of wealth creation and cultural influence and provide the resources for elites` accumulation and ongoing access to power. Sociotechnical structures are complicated systems, and when things inevitably break down, repair is a critical means of maintaining and reproducing elites` access to these systems, including the direction and outcomes for repair---or whether repair is even seen as necessary at all. I focus on two main dimensions of repair that tend to

support elites` control over infrastructural systems and the power that can be gained from this access. The first dimension centers on the role of the state, and especially state-sponsored systems of expert knowledge and technical capacity as a means of developing and controlling sociotechnical systems. The second dimension I describe is the process of discursive repair, or the coordination of technical and cultural frames that shape the terms of debate around infrastructures, especially in times of crisis and change. To support and illustrate my argument about sociotechnical repair and power, I draw on a series of ethnographic and historical case studies.

Digital Myths, Identities and Moral Economies *Janaki Srinivasan, International Institute of Information Technology - Bangalore; e oreglia*

The diffusion of major new technologies in society is often accompanied by a set of myths that tell us how these technologies will change, clearly for the better, the social and economic fabric of a community (Adas 1990; Headrick 1981; Nye 1992, 1996; Standage 1999). Digital technologies too are associated with certain myths, including the death of distance and of mediators, the end of history and of politics (Brown and Duguid 2000; Mosco 2004). How are these myths created and who contributes to their circulation? To what extent do these myths shape the moral economy—that is, traditional views of social norms—where digital technologies are deployed? Drawing from our ethnographic fieldwork in India and Myanmar, we address these questions in the context of the deployment of ID systems and of mobile phones (including mobile money platforms) in the Global South. We build on Mosco's idea of myth as a force shaping discourses around the introduction of new technologies (Mosco 2004), but depart from his argument that myths disappear once technology enters the "prosaic world of banality." On the contrary, using the design and deployment of ID systems and mobile phone as examples, we show that myths persist long after technologies are in common use, because myths and myth-making influence the 'moral economy' within which technologies are wielded everyday. We focus on three aspects of the myth that surrounds these technology systems: disintermediation, death of distance, dematerialization. Together, these mythical qualities associated with the technological systems in question shape the everyday practices of people, including how they are able to leverage their identities in the worlds they inhabit.

Session Organizer:
Janaki Srinivasan, International Institute of Information Technology - Bangalore

176. Latin American Science, Technology and Society: Women, Gender, and Sexuality Issues 1
Papers for Open Panels/Latin American Science, Technology and Society: Women, Gender, and Sexuality Issues
Open Panel
9:00 to 10:30 am
ICC: E5.9
Latin American feminisms have addressed an array of historical, sociological, medical and other issues focused on women, gender and sexuality. These include historical and present day still–colonial engangelments of gender and sexuality with race, ethnicity, biological, pharmacological, medical and other issues about the treatment of women, men, lesbian, gay, and trans peoples. How do these issues effect government, economies, political activism and other social and cultural policies and practices? The focus is on issues IN Latin America, but also FROM Latin America. The emphasis is on making Latin America the subject of global thought, not just an object of other people's thinking. How does and should Latin American thinking, policies and practices have effects elsewhere around the globe, and how do policies and practices elsewhere have effects in Latin America.

Participants:

Including Latin American Women, gender, and sexuaity perspectives: The positivist unity of science again? *Sandra Harding*

Do some supposedly progressive feminisms and anti-colonialisms address women, gender and sexuality issues in ways that re-legitimate the widely-abandoned positivist Unity of Science projects? How does this tendency simply reconfigure Eurocentric colonial epistemological, ontological, and methodological frameworks? How is modernity implicated in this problem? This presentation will identify this widespread phenomenon, and also some innovative paths that lead beyond such familiar modern conceptual horizons.

Making Care (Multiple) in Maputo: Placing Feminist STS in the African City *Ramah McKay, University of Pennsylvania*

What happens if we center our analyses of medical care in the city, not the clinic? How are care and medicine made in Maputo, Mozambique? This paper builds on recent feminist (and) postcolonial STS interventions (Harding 2009, Hecht 2002, Langwick 2011, Mavhunga 2012, Pollock and Subramaniam 2016) to analyze the ontologies, epistemologies, places, and relations through which care is made. Examining the multiple relations of health, medicine, and the city through which women fashion care in Maputo, the paper shows how medicine is constituted through multiple therapeutic, religious, and biomedical practices, and by relations of friendship and kinship, especially among women. While critical studies of global health have unpacked the global power dynamics that shape the provision of care, these analyses often remain centered in clinical spaces. Feminist STS approaches, by contrast, have privileged care as the ontological labor of making multiple "relational worlds" (de la Bellacasa 2012, Mol 2002), yet have not always interrogated the histories that shape those worlds. Discussions of STS in Africa, in turn, enable the interrogation of what care and medicine mean (Mavhunga 2017, cf. Feierman and Janzen 1992), and of the polysemic relations through which people live with it, in African cities (De Boeck 2015, Pype 2017, Simone 2004). Ultimately, this paper argues that bringing these approaches together with feminist STS approaches to care can productively unsettle the stabilizing universalisms that underpin notions both of care and health in African places.

Planning Quechua Families and Imagining the Nation: Kinship, Citizenship and the Self in the Peruvian Andes *Rebecca Melanie Irons, University College London*

Biomedical methods of family-planning, and the associated discourses, arguably do more than simply protect against unwanted pregnancies; they can affect subjectivity, concepts of the family, self, and citizenship. In the Andes, the association between biomedicine and discourses of whiteness and modernity have already been drawn, particularly as they pertain to reproductive health (Roberts, 2012). Namely, women may seek IVF-treatment

or caesarean scars as 'evidence' of their relationship with biomedicine, that in turn affords them social 'whiteness' and 'modernity'. However, not all may have such free choice in the matter. Peru's 'intercultural' birthing policy was introduced as a way to encourage Quechua women into the hospital with a doctor, and out of the home with a midwife, and has been criticised as an attempt to manipulate the subjective identities of these women; creating 'modern', 'less-Indian' citizens through an enforced association with biomedical care (Guerra-Reyes, 2013). Considering also the recent history of state-enforced sterilisations of rural, indigenous Peruvians during the 1990s, this Foucauldian biopower may be therefore directed specifically towards those citizens deemed most 'worthy of discipline' due to ethnicity (Bridges, 2012). Whilst doctors may no longer attempt to influence fertility through force, this does not indicate an absence of will to mould patients into a certain kind of citizen belonging to an imagined Peruvian nation; one that is 'modern' and 'white', with biomedicine-use and small families as vital to this 'development'. Based on long-term qualitative ethnographic fieldwork in Ayacucho, this paper investigates the relationship between the family-planning programme and Quechua subjectivities, kinship, and citizenship.

Precarious Knowledge and Counterpublic Knowledge in Brazilian Transgender Movement *Thiago Coacci*

The boundary between science and politics is becoming more porous each day, and as a consequence the language of citizenship and human rights are not enough anymore in most political conflicts, and social movements are adapting and adding a technoscientific framing, learning to "hack" science. I argue that social movements acts identifying precarious knowledge, that is, the systematic absence or invisibility of production of knowledge in a related topic, and from this diagnosis acts to produce/promote counterpublic knowledge, that is, politically driven knowledge in order to counter precariousness, demand public policies, new legislation and produce social change. This paper focus on the Brazilian Transgender Movement (BTM), throughout its three decades of existence, it has denounced on one hand the complete absence of data on official data on transgender lives; and on the other the inadequate representation of transgender experience by science, especially by psychiatry and psychology that frames their identities as pathological. Through an ethnographic approach, I analyze two ways in which BTM tries to tackle this precariousness and frame its demands: an annual report on transgender murders in Brazil, compiled by Rede Trans Brasil; and the production, by transfeminist cyberactivism, of a new language and interpretative scheme to understand and talk about transgender people that is not pathological.

Session Organizer:
Sandra Harding
Chair:
Sandra Harding
Discussant:
Sharon Traweek, UCLA

177. Affordances and Architectures: A Materialist Approach to Digital Design 2
Papers for Open Panels/Affordances and Architectures: A

Materialist Approach to Digital Design
Open Panel
11:00 to 12:30 pm
ICC: C2.1
The design of technological objects and systems cannot be separated from the social structures within which they arise and operate. People and things are mutually influential and co-constitutive. This simple idea—that people shape technologies and technologies shape people—undergirds recent advancements in affordance theory and platform/infrastructure studies. Across disciplines, scholars are developing precise language and robust frameworks for understanding how social dynamics are built into socio-technical systems and how socio-technical systems structure social dynamics. These theoretical advancements arise through and alongside critical work on digitization and automation as an integral component of personal and public life (see especially Nagy and Neff 2015; Plantin et al. 2016; Davis and Chouinard 2017; and Evans et al. 2017). This panel seeks to implement, build on, and apply clear conceptualizations of "affordance" to better understand how the architectures of digital platforms and infrastructures take shape and exert force. An affordance perspective on digital architectures fosters questions about the social antecedents to design decisions as well as questions about social and institutional effects. For instance, what is the interplay between administrative medical interfaces and physician-patient relations? How do dating apps with "swipe" functions (re)formulate intimacy and courtship rituals? What agendas are embedded in digital maps, and how do these mappings inform experiences of space and place? How do vote-based visibility algorithms encourage or discourage dissent? We seek to strengthen a theoretical orientation towards the materialist study of digital design through serious treatment of technological affordances.
Participants:

Investigating Vigilantism and Its Agency in a Reddit Collective of Websleuths: A Sociomaterial Approach *David Myles, University of Montreal*

Since the online manhunt that followed the 2013 Boston attacks, Reddit has been intimately associated with online vigilantism. While journalists have questioned Reddit's responsibility in this event (mainly, its culture and algorithms), vigilante initiatives represent a significant departure from the platform's primary para-journalistic purpose. Drawing from a four-year non-participant observation phase and discourse analysis, this presentation investigates a subreddit called the Reddit Bureau of Investigation (RBI) that was popularized in the wake of the Boston attacks. It specifically analyzes the textual agency of vigilantism when it is invoked discursively within the RBI. Our analysis shows that invoking vigilantism (to distance oneself or to condemn others) and staging it against police professionalism performs important tasks, like defining the collective's goals and its members' identities. Furthermore, it underlines the role of Reddit's affordances in materializing such discursive practices. For example, the persistence and visibility afforded by the subreddit's functionalities (like the logo, the sidebar, or the original post) allowed for users to quickly delineate (un)acceptable ways for potential victims to ask for help and for websleuths to investigate. Reddit's karma point system and ranking algorithms also played a significant role in sustaining these practices by allowing both textual and quantitative ways of reinforcing the antagonistic configuration established between vigilantism and police

professionalism. Hence, by considering the entanglements between human (the users) and nonhuman (discourses, affordances, algorithms, etc.) actors, this presentation further illustrates the sociomaterial nature of the processes that intervene in the constitution and the performance of online collectives.

Locative media, affordances and the duality of resources and routines *Eric Lettkemann, Technische Universität Berlin; Ingo Schulz-Schaeffer, Technical University of Berlin*

The focus of our presentation lies on the affordances of locative media. Locative media are social media apps on mobile devices designed to provide users with additional information about their current location. Usually, these are designed to change the experience of material space via the interface of a smartphone. Some apps link virtual annotations to GPS coordinates (e.g. "Foursquare"); others serve as a social radar to locate nearby friends or to look for potential flirt partners (e.g. "Tinder"). Locative media have the potential of changing their users' perceptions of urban spaces by suggesting particular location-based activities such as meeting a friend that happens to be nearby or making a detour to a place that seems to be a promising "PokéStop". The affordance concept as applied by Norman to human-machine interaction is a good starting point to analyse locative media. However, a lot of research in STS and beyond has made clear that technology-in-use is but a snap shot in the ongoing process of the co-construction of technology and users. The perceived affordances of locative media, thus, should be viewed as temporary stabilisations in ongoing interactive processes in which users change their routines and practices in accordance to their interpretations of how the services provided by locative media might be useful for them while the providers of these locative media adapt digital designs of their apps to these emerging practices. By focussing on this duality of resources and routines, we will elaborate on the perceived action possibilities provided by locative media.

Material Constraints and Digital Affordances in a 'Smart' Educational Building *Allister E Hill, RMIT University*

My paper will reflect on the interplay between digital infrastructures and everyday organisational practices in a technologically laden 'smart and sustainable' university building. It is this building/object, in which I have been conducting an organisational ethnography, attuned with a sociomaterial sensitivity (Carlile et al. 2013), for my PhD. I will explore the tension between design intentions, for wired and wireless mobilities, and lived experience, located within a space that was explicitly anticipated to redefine and facilitate digitally enhanced teaching pedagogies and active learning practices. Looking at, amongst other things, the materiality of the teaching spaces themselves, introduction of BYOD policies, the impact of unconventional/jagged geometry on digital and spatial experience, as well efforts to replace analogue signage and information provision with digital forms. I will also render visible the relationship between mobility, connectivity and the ever-present need to power an increasing number of digital devices. Ultimately, however, all of this is precarious and temporally emergent as the seemingly fixed infrastructures are iteratively modified and reassembled. This can be in terms of hardware, such as upgraded Wi-Fi routers that can handle greater numbers of devices. Or software upgrades that

facilitate simpler connections to those Wi-Fi networks, as they require less configuring. In discussing the above, I will build on the sociomaterially attentive work of Paul Leonardi (2011, 2012, 2013), who has critiqued accounts of the constitutive entanglement of sociomateriality (also described as agential-realist accounts, following Barad (2003, 2007, 2013)) for not accounting for the constraints, of the material affordances, embedded in the artefacts humans are entangled with, digital or otherwise.

Opening a Virtual Door: Enrolling Actors in Networks through Affordances in Video Games *Valentin Kohlmeier, Hochschule Harz*

Doors in Video Games await at the intersection between the players perceived world and the unknown territories of the artifact. As part of the interface, they connect the active network of the player, already mobilized through the activity of play, with the possible, not yet activated network behind the door. How does the game communicate its possibilities? What are the presuppositions for the player to be afforded this simple action? This paper uses the translation process, as proposed by Actor-Network-Theory, to study Affordances in Game Design. In order to establish new actor-network relations through the technical artifact, the artifact itself has to be able to communicate its own network capabilities, thus enrolling the users into its potential network. For this reason, I would like to argue that affordances may be described as processes of translation on part of the artifact. The player herself needs to be aware of digital objects in their 'materiality' - through means of her suspension of disbelief, prior knowledge of real doors and the (partial) awareness of the in-game objects and their possible interactions. In order to enroll the player as an actor, the door creates a problem, a possibility space. The door is part of the potential network in which the player is supposed to be enrolled. Affordances call upon hybrid actors, who realize their possibilities of expanding their interaction into networks that might have been alien to them.

SkillsFuture, total education, and the colonization of everyday life in Singapore *Mark Baildon, Nanyang Technological University; Roberto de Roock, Nanyang Technological University*

Singapore is a neoliberal developmental state that has viewed education as essential for nation building, social cohesion, and perpetual economic growth (Koh, 2007). SkillsFuture is a national program in Singapore designed to "empower every Singaporean to plan their education and training into their working life" (http://www.skillsfuture.sg/). The MySkillsFuture website is featured as a one-stop education, training and career guidance online portal. This paper analyses the MySkillsFuture portal as a digital object, and situates SkillsFuture in Singapore's educational, historical, political, economic and ideological contexts. Following a postcolonial STS approach (Anderson & Adams, 2007; Suchman, 2011), we examine the portal not simply as a digital text or director of traffic, but as a site of procedural rhetoric (Bogost, 2007), where online procedures are used persuasively to shape neoliberal subjectivities through everyday enactment and reiteration (Suchman, 2005). We consider the extent to which skills development, lifelong education and career development goals and initiatives constitute forms of governmentality (Ball, 2005) that

create a disciplined society and workforce appealing to global capital, and through which subjects can carry out government policies and be governed (Foucault, 1991). We also examine what is excluded and invisibilized: skills to address pressing global issues (e.g. inequality, poverty or sustainability) or for understanding the world, others, power, etc., except perhaps as instrumental skills that support "industries" and economic growth. As such, the digital portal serves as a location of recontextualized colonial discourses (Philip, 2010, 2016).

Social media, politics and the "accident" of speed *Naomi Smith, Federation University Australia*

Social media, as a technical achievement is part of a complex assemblage of socio-technical systems that "request, demand allows, discourage, and refuse" (Davis and Chouniard 2017: 242), certain types of subject-artefact actions. I argue that central to the affordances of social media is the concept and practice of speed. The phrase 'going viral' demonstrates how speed is central to user perceptions of social media, while also being a material technical achievement. I argue that speed-focused digital design has real effects on the quality of knowledge transmitted through social media. To focus this theoretical account I use examples from the 2016 US Presidential Election to interrogate the role of speed as an affordance for and of social media. Focusing on affordances provides a way to link ambiguous concepts such as 'fake-news' or 'post-truth' to the materiality of digital infrastructure. The 'accident' of the affordances social media is that it heightens the process of liquefaction identified by Virilio, collapsing delineations between the real, the visual and the virtual. Knowledge transmitted through social media begins to lose its relationship to previously established hierarchies of facts. The intensification of speed, or the hyper "dromology" of social media (re)configures the topology of the multi-dimensional social space much faster and with more intensity than ever before. Factual news reporting seems to matter less than the affective and aesthetic properties of knowledge. Examining the affordances of social media illuminates how the present dynamics of politics are tied to social-technical systems.

Session Organizers:
Jenny L Davis, The Australian National University
Timothy Graham, Australian National University
Baptiste Brossard, The Australian National University
Chair:
Timothy Graham, Australian National University

178. Science and Activism: STS and the Environment
Papers for Open Panels/Science and Activism: Trans-Disciplinary STS Approaches
Open Panel
11:00 to 12:30 pm
ICC: C2.2
Science and activism have multifaceted, challenging and often controversial interactions. Within scientific disciplines, activism may play out in cultural upheavals, destabilized conditions of knowledge production, contested funding regimes, and democratization of processes or outcomes. Alternative narratives, diverse methodologies, and public debates may underpin struggles for increased transparency in science and preservation of a meaningful, critical role for science institutions. Interventions from outside the discipline may include critique, dissent, protest, threats

or total disruption. By opening up the politics of representation, sense making and engagement in relation to science, activism potentially plays a catalytic role in the STS quest for justice and social transformation. The aim of this panel is to examine the intersections of science and activism, to offer new perspectives on science agendas, interests, policies and practices, and to foster mutual knowledge exchanges. The following questions are suggested as possible avenues for exploration: How do science and activism intersect, challenge, transgress and dismantle particular valuing systems to engender social change? What kinds of trans-disciplinary STS justice perspectives advance our understanding of the politics of science? How can the politics of scientific representation be reconfigured – in other words, how are authority, expertise, interests, and media implicated in public controversies and transformations? In what ways do scientific and activist popularization strategies open up and close down opportunities for interventions, mutual exchange, and engagement? Contributions that explore trans-disciplinary possibilities for new modes of thinking and action are particularly welcome but not the sole focus of the panel.

Participants:
Rethinking activism: science and social science in conversation *Judy Motion, UNSW*

Traditional understandings of activism fail to take into account the ways that scientists may seek to disrupt the status quo and create positive social change. A collaborative science-social science research project will be presented to explore the following research questions: What do we mean when we use the term 'science and activism'? How do we make sense of the diverse ways that scientists create change – in other words, how do science and activism intersect, challenge, transgress and dismantle particular valuing systems to engender social change?; and, in what ways do scientific and activist popularization strategies open up and close down opportunities for interventions, mutual exchange, and engagement? In addition to sharing research results, scientists and social scientists will engage with these issues during the panel. This is intended as an interactive panel presentation that will open up discussion of how activism is practiced in science and how alternative approaches may be popularized. The aim, here, is to integrate multiple perspectives on science and activism, including key findings and conclusions from papers presented in the Panel 69 - Science and Activism: Trans-Disciplinary STS Approaches.

For the love of coal. Post-truth politics and climate change in Australia *Vanessa Bowden, University of Newcastle*

As the stakes of climate change become increasingly apparent, it seems that 'post-truth' politics threatens to push us further into the anthropocene. This realisation has lead to a somewhat unusual scenario, with a number of prominent scientists turning to activism and social movements to communicate their concerns. On the other end of the spectrum, conservative Australian politicians have taken to revealing their preferences for coal with emotive stunts in parliament in support of the industry. These dynamics, this paper argues, are part of the 'post-truth' cultural moment currently being experienced in most Western nations; and reveal a further shift away from policy and debate based on notions of science and fact. In contrast to claims from Ulrich Beck and Manuel Castells that technology would democratise knowledge and lead to more socially just and environmentally

sustainable outcomes, even the most shallow analysis of climate change exposes these hopes as somewhat naive. This paper makes use of media items, as well as interviews with business leaders in the Hunter Valley of New South Wales, to analyse the influence of post-truth politics on climate change policy in Australia, with the suggestion that any movement for climate mitigation must consider the issue within this frame.

Flattening the World for Social Change: How STS studies is inherently a political activity *Hannah Cowan, London School of Hygiene and Tropical Medicine*

This paper illustrates how boundaries are drawn between activism to "save" the UK National Health Service (NHS) and the purportedly apolitical science of hip replacements (an example used due to its current focus on 'streamlining' care). It critiques the way in which activists build campaigns around grandiose narratives such as neoliberalism, privatisation, and government, whilst holding healthcare workers "on the ground" as noble and inert. Meanwhile hip surgeons play, or indeed tinker (Mol, Moser and Pols, 2010), with anaesthetic mixes, materials for hip implants, and surgical tools to reduce the time patients spend in hospital after their operation. Whilst this paper traces how these everyday 'innovative' techniques have potentially negative effects on patients and indeed contribute to some of the activists' concerns, healthcare staff view themselves as apolitical. The politics of the NHS is seen as a ceiling too high to reach; an idea which is materialised through the campaigners' leaflets, marches, and petitions. This paper argues that the everyday actions of both activists and healthcare staff build hierarchical boundaries which close down opportunities for social change. Rather, we should focus on STS studies' propensity to flatten structures and "act on the world" by tracing how everyday practices contribute to the doing or undoing of power (Deleuze and Guattari, 1987; Singleton and Law, 2013). I argue that this is an inherently political exercise whereby actors are given the agency to break those hierarchical structures and unmake the ties of power previously positioned in some far-off, overbearing, social or economic realm.

Activism and engagement in the science of politics: Political Science as a site of STS analysis *Elizabeth A Lowham, California Polytechnic State University; Jane L Lehr, California Polytechnic State University*

What can we learn about the politics of science by focusing on the politics (and non-politics) of Political Science? This paper takes the discipline/field/area of Political Science as practiced in the United States as a site of analysis to explore relationships between science and activism. With its roots typically recognized as an effort to improve decision-making through knowledge creation, the discipline has always experienced internal tension about its responsibilities and relationship to social/policy change. We explore how the relationship between Political Science as an authoritative/expert field, the interests of scholars in the field, and activism have been understood and negotiated by focusing on events that have created opportunities for political scientists to examine a) the use of their produced knowledge (e.g., modeling the 2000/2016 presidential elections), b) their engagement with social change and activist movements (e.g., Arab Spring, Black Lives Matter), and c) their role in shaping policy (e.g., climate change, globalization). We

then describe how tensions and anxieties in the current moment play out for faculty and students within a Political Science department at our university, including increased opportunities for self-reflexivity about disciplinary practices/norms and the need to identify structures to support such exploration, including an emerging collaboration with our STS Minors Program. We conclude by exploring how increased attention to the social sciences can better position STS to explore how science and activism intersect by serving as a resource for scholars seeking to understand and account for their own relationships between knowledge production and activism.

Citizen-led digital infrastructures as an alternative to political ineffectiveness: the 2017 Mexico City earthquake *Luis Ignacio Reyes-Galindo, State University of Campinas - UNICAMP; Aline Guevara Villegas, Universidad Nacional Autónoma de México (UNAM); Isabel Flores López, Universidad Nacional Autónoma de México (UNAM); Jorge Sosa, Universidad Nacional Autónoma de México (UNAM)*

On 19 September 2017 morning, a magnitude 7.1 earthquake hit Southern Mexico, which caused 396 deaths, 40 collapsed buildings, massive damage to water, electricity, health and education infrastructure, and over 250 thousand displaced homeless individuals. In Mexico City alone, almost 3,500 homes had to be unoccupied due to massive structural damage. Immediately after the event and due to the city's previous experiences with deadly earthquakes in the near past, citizen rescue bridges and aid collection cells began to self-organize, helped by barebones security support from the military and international assistance. However, general government support – both federal and local – was and continues to be insufficient when not counterproductive to citizen interests, leading to the emergence of alternative infrastructures and the use of social media to sidestep political ineffectiveness: as increasingly seen in international disaster events and political turmoil occasions, Twitter, Facebook and mobile apps supplanted traditional forms of communication infrastructures. Online platforms like @verificado19s became the go-to channel for both accessing and crowdsourcing trustworthy information on earthquake damage. In this talk, we will present the development of Tubarrioterespalda.org, a citizen+science led platform for coordinating direct contact between earthquake victims and anonymous relief donors, initiated by an interdisciplinary team of academics and activists. The talk will center on the intervention of STS and Sci-comm researchers in the platform development team, as it faced the challenge of implementing and planning the platform, where three issues were of paramount importance: the framing and development of citizen trust in the current setting of mistrust pervading traditional Mexican institutions; the socio-technical challenges of building an effective and anonymous communications infrastructure; and the development of 'horizontal' digital platforms as a response to ineffective hierarchical organizations in the Mexican context.

Scientific Activism - A Challenge for STS Researchers *Ullica Christina Segerstrale, Illinois Institute Of Technology*

Activism by scientists themselves can take many forms. It has been particularly visible in controversies having to do with potentially adversary social consequences – such as

the early experiments with recombinant DNA or GMOs, or the claims in the IQ and sociobiology debates in the United States. Here one could typically see two activist camps pitted against each other, arguing their differences in both the academic and public realms, both sides presenting themselves as acting for the benefit of society and speaking for "good science". Later in the Science Wars a group of pro-science activists defended science against the criticisms of humanists and social scientists. These science warriors saw themselves as leftists. The STS researcher is on contentious territory, indeed, in regard to the actual political intent of the actors, and may be seen as an enemy by everybody. Yet, in order to identify the actual core of a conflict, understanding the underlying issues on both sides is crucial. For instance, scientific facts play a central role in the fight for social justice – as pointed out by the pro-science warriors. At the same time it seems that the very existence of scientific activism and well-publicized controversies with strong moral/political aspects can help change social norms and motivate needed social reform. An example is the explicit concern about ethical issues in regard to the Human Genome Project, which I see as a directly influenced by the earlier serious debate about sociobiology.

Session Organizer:
Judy Motion, UNSW

179. STS Across Scale: 4S Meets Regional STS Organizations
Single Paper Submission
Special Event
11:00 to 12:30 pm
ICC: C2.3

4S is an international society, linking STS scholars around the world. In this session, representatives from regional organizations will participate in a roundtable dialogue, moderated by 4S President Kim Fortun, to consider how 4S can best support and partner with regional STS organizations.

Session Organizer:
Kim Fortun, University of California Irvine

180. Indigenous Knowledges and Technologies 2
Papers for Open Panels/Indigenous Knowledges and Technologies
Open Panel
11:00 to 12:30 pm
ICC: C2.4

Indigenous knowledges and technologies, i.e. knowledge and artefacts produced by native people from around the world, such as Amerindians, Aboriginal Australians, and so on, are a marginal topic in STS. Few studies, articles, and books have been published on the topic in spite of the array of experiences and approaches from other fields such as media studies, anthropology, telecommunications, human rights, to mention a few. About the late 1980s and early 1990s there was a turn in STS towards the science-policy interface, which resulted in local knowledges and expertises becoming an emerging topic in the area. Nowadays, citizen and open science are popular research topics and receive growing attention from STS scholars. However, indigenous knowledges and technologies remain a marginal topic in the field. STS appears to still be in need of a process of decolonisation as to a large extent it is still insensible to knowledges, technologies, practices and epistemologies that have arisen from indigenous people around the globe. This panel seeks to bring together researchers interested in a range of topics related to indigenous knowledges and technologies, including, but not restricted to: a) the appropriation of Indigenous knowledges and technologies; b)

Indigenous knowledges and technological policymaking; c) Uses and developments of information and communication technologies (ICT) by indigenous peoples; d) Decolonial and Postcolonial indigenous STS; e) Clashing ontologies between indigenous and modern societies; f) indigenous knowledges and sustainable community development

Participants:

A framework for learning and applying law based on indigenous knowledge *Erick Huerta Velázquez, Redes por la Diversidad, Equidad y Sustentabilidad A.C.*

Traditional knowledge incorporates an understanding of the relations that govern the universe those that should also rule the life of the members of a tribe or clan. By following these teachings in my doctoral research we were able to understand develop an implement a new framework for studying and change regulation on communication and media. These new framework considers focusing on cultural values and physical laws and praxis to a legitimate situation that can be recognized by the legal system. By applying these framework for the first time in history GSM spectrum was assigned to an indigenous cooperative to run the first indigenous mobile network, which now operates in the state of Oaxaca Mexico.

Communality and technological autonomy of the indigenous people of Oaxaca, Mexico *Carlos Francisco Baca Feldman, Redes por la Diversidad, Equidad y Sustentabilidad A.C.*

The proposal presented here, based on the results of my doctoral thesis, focuses on the experience of people who have chosen to use communication tools on the path towards the technological autonomy of the indigenous people of Oaxaca, Mexico. Specifically, the proposal will discuss the forms of appropriation of ICTs based on the systematization of the way of life of the indigenous people of Oaxaca: Comunalidad (Communality). Thus, taking into account its four axes (territory, collective work, political organization and party); we can contextualize various communication experiences that have developed in these communities. In a particular way, I will focus on some examples like the community-owned cellular networks, the organization Ojo de Agua Comunicación, the radio and video experiences in Guelatao de Juárez, and the Community Diploma of Promoters in Telecommunications and Broadcasting "Techio Comunitario". In this way, it will be possible to establish a discussion around the way in which the expansion of ICTs and the form in which they generate social processes, help find solution of particular need in indigenous communities. However, the forms of technological appropriation that these communities have developed are not outside the framework of contradictions typical of the capitalist mode of production and the State. In this sense, it is key to investigate the way in which these processes occur in order to think about how the tools of communication have been (re)signified based on the ways of life of each community.

Indigenising Foodscape: The Resurgence of Natural Farming of Tayal People and their Local Knowledge System in Taiwan *Yih-Ren Lin, Taipei Medical University*

This paper argues a location of food production is not merely a physical space, but rather a landscape created by a complicated social process within which local people's traditional value, belief and knowledge system interacts with modern market mechanism and scientific thinking.

B'bu territory of indigenous Tayal people in Taiwan and their food production system is the research site and the issues. The researcher employs a participatory action research by engaging with the ecological aspect of Tayal people's community development, traditional territory, and land rights issues for over 15 years. One central theme of the long-term research is related to the understandings about the foodways of the people. This paper attempts to reveal the resurgence of local foodways of the Tayal people reflected from the past participation experiences. Four major findings will be presented. First, how do the local Tayal people produce food traditionally? Secondly, in what ways the people's value and knowledge system is linked to their food production? Thirdly, how do the modern chemical agriculture and market system be brought in and impact the traditional food production practices? Fourthly, analysing the resurgence of traditional natural farming of food production so as to create an indigenous food landscape. This paper concludes with discussing the knowledge dialogue between the modern development viewpoint driven by capitalistic market mechanism and traditional scientific perspective, and local indigenous worldview from their agricultural practices.

Internet Infrastructure as a Network of Relations, Devices and Expectations: A Lost Link Between an IXP and Indigenous Communities *Fernanda Ribeiro Rosa, American University*

This paper aims to problematize international organizations narratives about the role of Internet Exchange Points (IXPs) to bridging the digital divide and making broadband more accessible by improving internet quality and reducing broadband prices (Intven & Tétrault, 2000; Blackman & Srivastava, 2011; Weller & Woodcock, 2013; CAF, 2014). It does that examining the IXP policy-making environment and the experience of indigenous communities in rural areas to have access to the internet. IXPs are internet nodes where many networks interconnect to exchange traffic and optimize their costs to transport data. Although IXPs are a critical element of the internet architecture, they are opaque to the general public, and its materiality (Lievrouw, 2014) needs to be unpacked and "de-blackboxed" (Latour, 1999). The present analysis will focus first on the regulatory and market challenges for the first IXP in Mexico. Built in 2014 and celebrated by some actors, there have been promises and expectations created around it, however, the present research shows the still-lost link between its creation and the benefits for unconnected rural areas within the country. Second, the article focuses on the action of indigenous peoples, small Internet Service Providers (ISPs) and non-governmental organizations in Mexico that brings to the surface the complex network of relations that is necessary for the internet to reach unconnected regions where big ISP representatives say it is not profitable to invest. I approach the internet infrastructure through its visibility attributes (Larkin, 2013), its significance to people and the successes and failures to bridge the digital divide in view of the market competition and the private actors' strategies. Bamboo towers, antennas, unregulated frequency band, management software, along with human relations, make new internet connections possible, visible and material, showing that while infrastructure is generally approached by its invisibility, there is an array of visibilities (Larkin,

2013) to be explored. Ethnographic methods comprising observations and in-depth interviews with Tseltal and Zapoteco peoples in Oaxaca and Chiapas, and policymakers, academics and the Internet Exchange Point team in Mexico City form the empirical material analyzed. Works cited: Blackman, C. & Srivastava, L. (2011). Telecommunications Regulation Handbook. The World Bank, InfoDev, IFC, ITU. CAF – Banco de Desarollo de América Latina (2014). Expansión de Infrastructura Regional para la Interconexión de Tráfico de Internet en América Latina. Intven, H. Tétrault, M. (2000). Telecommunications Regulation Handbook. The World Bank, InfoDev. Larkin, B. (2013) The Politics and Poetics of Infrastructure. Annu. Rev. Anthropol. 2013. 42:327–43 Latour, B. (1999). Pandora's Hope: Essays on the Reality of Science Studies. Cambridge, MA: Harvard University Press Lievrouw, L. (2014) Materiality and Media in Communication and Technology Studies: Un Unfinished Project in Gillespie, T; Boczkowski, P. J. Foot, K. A. (2014). Media technologies: Essays on communication, materiality, and society, Cambridge MA: MIT Press Weller, D. and Woodcock, B. (2013), "Internet Traffic Exchange: Market Developments and Policy Challenges", OECD Digital Economy Papers, No. 207, OECD Publishing. http://dx.doi.org/10.1787/5k918gpt130q-en

Investigating Indigenous Peoples' Participation And Inclusion In Climate Action: An Examination Of Tweets From The UN Climate Forum *Alyson Young, IUPUI, Human-Centered Computing; Angela P Murillo, IUPUI*

One of the most significant challenges facing humans is climate change. Traditionally scientists have approached researching climate change through data collected by satellites, sensors, and models. With the introduction of the Anthropocene, we are beginning to see the introduction of local information to inform global knowledge, since human impacts to the Earth's geology and ecosystems are not easily observable from space. Consequently, many scientists are calling for the integration of traditional ecological knowledge with Western-based science. Indigenous communities possess detailed and longitudinal knowledge regarding the sustainability of local resources and environmental data such as wind, snow, and ice. Despite this, indigenous peoples are often excluded from climate discussions, and their knowledge and technologies have only superficially been integrated into scientific analyses. In this talk, we examine the inclusion of indigenous peoples in conversations about climate change through a qualitative content analysis of tweets from the COP23 Sustainable Innovation Forum that took place in November 2017 in Bonn, Germany. Focusing specifically on those COP23 tweets that reference the keyword indigenous, we investigate the perceived role of indigenous peoples in climate action. Of particular interest are differences in perspectives between indigenous and non-indigenous peoples and organizations as to the extent indigenous peoples are viewed as equal and active partners in climate justice. Our results suggest that while non-indigenous people believe that indigenous peoples, through the creation of the Indigenous Peoples' Platform, have obtained equal consideration in the movement, indigenous peoples still do not see themselves as equal and active partners.

The twain shall meet: making space for collaborations in indigenous knowledges and western science *Emily Hull, University of NSW; Leah Lui-Chivizhe, University of Sydney*

The inclusion of indigenous knowledge into sustainability and archaeological discourse continues the compartmentalisation of indigenous knowledge as 'ethno'-science. Although this term acknowledges the epistemological shift between indigenous and western knowledge systems, it acts to categorize knowledge not by the truth of the creation but rather by who created it. Evidently, colonial perceptions of ethnicity, rooted in understandings of the other, continue to define the way in which science engages with indigenous knowledge. The imposition of western frameworks onto indigenous knowledge enables scientific discourse to not only decide what aspects of knowledge are presented but also determine how the knowledge is understood. Moreover, the use of western frameworks to validate indigenous epistemologies divorces the knowledge from its cultural context, resulting in the simplification of indigenous knowledge or its assimilation into western academic institutions. In this paper we argue that meaningful engagement between indigenous and western knowledge systems is reliant on the separation of science, as a discourse that appropriates, produces and distributes knowledge, from the Enlightenment philosophies that inform it. Drawing from our own experiences we present examples and discuss how working collaboratively with Indigenous knowledge holders can create spaces for productive possibilities, challenge the appropriation of indigenous knowledges and enhance interpretations of science.

Session Organizer:

Claudia Magallanes-Blanco, UNIVERSIDAD IBEROAMERICANA PUEBLA

181. Quality, Quantity, and Transnational Expertise
Closed Panels
Traditional (Closed) Panel
11:00 to 12:30 pm
ICC: C2.5

How are quantities—abstract properties measurable through amount, number, magnitude, multitude, or the like—infused with qualities—material, often concrete or physical, traits, attributes, conditions, or properties? How are the abilities to make judgements—especially judgements judged to be accurate—about quantity and quality institutionalized and made socially recognizable as expertise? This panel aims to bring STS scholarship on quantification and qualification (Porter 1995; Verran 2001; Callon and Law 2003) into conversation with ethnographic studies of the global–transnational flow of local elements (Munn 1986; Knorr Cetina and Bruegger 2002; Chu 2010) and contemporary semiotic theory (cf. Kockelman 2013; 2016). Papers in this panel seek to ask: How do regimes of quality, quantity, and expertise circulate transnationally—that is, between or across boundaries, borders, barriers, or partitions? How is this circulation made invisible? How do quality, quantity, and expertise become mutually-authorizing or mutually-legitimating agents in producing knowledge that is intended by its producers to travel? Where, when, and how is expertise emplaced? That is, what are the sites at which expert knowledges about quality and quantity are produced, despite attempts to render those knowledges and forms of expertise placeless? How do some places but not others—especially national territories—come to matter, to lend quality to the production of expertise? Participants provoke these

conversations through studies situated in a range of institutions, from narcotics policing to economic development and 'liveability' planning to calculation of environmental sustainability and beyond.
Participants:

Floating Cocaine Rates and Phantom Pharmaceuticals *Kieran M Kelley, University of Chicago*

In 2007, the Irish Coast Guard came upon 62 25 kilo bales of cocaine floating in Dunlough Bay, the result of a botched attempt to onshore the drugs through the choppy seas of Ireland's southern coast. The discovery prompted both a national dialogue about Ireland's vulnerability to narcotics traffic, as well as efforts to secure the border by recruiting a transnational network of police agencies and surveillance technologies. From this incident an entire genre of media reporting on drugs seizures emerged, which conspicuously featured monetary valuations based on forensic purity tests. This paper examines how this quantitative data transformed into palpable qualities of danger and risk. From this, I argue that expertise is less a form of technical proficiency in any domain, but more the ability to productively exploit the generative gaps between quantity and quality.

The Vicissitudes of Units: On the Calculation of Environmental Sustainability *Yukun Zeng, University of Chicago*

Environmental controversies hinge on global quantifications of local nature (e.g. Edwards 2010). However, although number is the key device for producing facts about the world (Porter 1995, Poovey 1998), a purely numerical quantification can only encompass the non-numerical world through the mediation of standardization (Bowker and Star 1999), accounting (Lohmann 2008), and metrology (Latour 1988), which synthesize the abstract number with society and nature. Following this scholarship, this paper examines a crucial but neglected mediator in the quantification process, namely the units of quantity. In particular, I focus on 1) how units network numbers with social and natural qualities, 2) how units determine whether heterogeneous qualities are commensurable in a formula, and 3) how incommensurability could be solved through different treatments of units. In 1980s, China's cybernetic account of population is actually single-unit-based calculation of sustainability, ended up with one child policy (Greenhalgh 2008). More recently, units' incommensurability is dodged by technical deductions in "scientific" examples like the Environmental Sustainability Index (ESI) designed by Yale and Columbia. Units are nulled through statistical standardization, which substitutes absolute elements (such as policies and gas emissions) with relative quantitative ranks. ESI could never indicate whether a country's environment is sustainable enough but only to what degree it is more or less sustainable than others. The paper concludes with a discussion of how Chinese people's consideration of sustainability evolved from socialist confidence of future to the anxiety of ranking in the contemporary global world.

The Indexicality of the Index: Governing by Rank in Global Singapore *Joshua Babcock, University of Chicago*

Published on 30 January 2018, Time Out's City Life Index ranked Singapore as the second least exciting city in the world (ranked 31 of 32) (Time Out 2018). Widely reported in regional media, the index's publication also became the focus of state response, as the Singapore

Tourism Board immediately released a response video ironically titled "Yeah, Singapore is Boring." Beyond the curious issue of why a state would respond officially to a ranking at all, more curious still is this particular ranking's relatively "unofficial" status. Produced by a private-sector lifestyle publication, the City Life Index differs from other "official" international indices that have famously driven state policy and national development in Singapore (Ng and Tan 2010). Part historical and part ethnographic exploration, this paper tracks the emergence and circulation of the "global index" as an expert technology for ranking places across disparate evaluative axes. After situating the "global index" in broader histories of visualized ethnological taxonomies of "national types" (Vermeulen 2015), this paper considers transformations in governance that have ensued in the wake of broad uptake of the "global index," such that even a trope of the "global index" can become worthy of state response, as the genre is authorized by imagined scientific and other expertise. Drawing on linguistic anthropological and semiotic theories of the "index" as a context-dependent "real connection" (Nakassis 2017; Silverstein 2003), this paper analyzes what it is that the "global index" is connected to, hence how it becomes an animating force in Singaporean governance and statecraft.

In Search of a Representative Country: The Politics of Site Selection in International Development Impact Evaluations *Margarita Rayzberg, Northwestern University* Randomized controlled field experiments continue to grow in number and legitimacy as a tool of social engineering in international development. Development economists have implemented field experiments in countries across the Global South. This wide range of sites might suggest that this method offers a universal, easily transportable template. In fact, site selection for field experiments is a fraught process. This was particularly true in the critical early years of the 1970s when the method was still gaining legitimacy. This paper explores an episode in the history of randomized evaluations that reveals how actors leveraged considerations of place to legitimate their method and raises larger questions about the relationship between sites and science. I analyze a series of reports published by the research team conducting the first documented randomized evaluation of an international development intervention. In these reports, the team details its travels to twelve candidate countries in search of the best experimental site. STS scholars have suggested that scientists use either authorized models or standardized criteria as sources of legitimacy for their scientific sites. This case shows that in a time of methodological and epistemic uncertainty the researchers responded by staging site appropriateness and representativeness by comparing each country to one another – rather than to a model or a checklist - to determine the most "average" site. Surprisingly, the logic of "averaging" continues to structure debates about site selection in contemporary field experiments in international development and speaks to the politics of representation and its relationship to knowledge claims.

Session Organizers:
Joshua Babcock, University of Chicago
Yukun Zeng, University of Chicago
Discussant:

Terry Woronov, University of Sydney

182. Travelling Knowledge (II): Health, Disease and Pharma
Papers for Open Panels/Travelling knowledge: theories, methods and empirical research made in circulation
Open Panel
11:00 to 12:30 pm
ICC: C2.6
Despite opposite forces recently observed, globalization still seems to be a driving force for much of current trends in science and technology. The increase of internationalization of scientific and technological practices, from faculty/student mobility to co-authorship of articles, is an indicator of a process that still needs further understanding. In this panel, we want to explore in depth how the circulation of knowledge by focusing on health issues, diseases and the pharmaceutical industry.
Participants:

Postcolonial Psychiatry and the Formation of Global Mental Health *David Robertson, Princeton University* In recent years the field of global mental health has received increasing attention from governments, NGOs and the public. Despite this rising interest, there are few attempts to analyse its historical formation. In this presentation I will unearth an important part of that history by examining the International Pilot Study of Schizophrenia (IPSS). Beginning in 1967, the IPSS was a long-term epidemiological project undertaken by the World Health Organization in nine "developed" and "developing" countries. It aimed both to ascertain the universality of this disorder and to trial the viability of collaborating with psychiatrists in developing countries. I argue that the IPSS was critical to the formation of global mental health because it was the first project to struggle with the political and epistemological implications of globalising psychiatry. Accommodating itself to a recently decolonised global landscape demanded that psychiatry resolve entrenched issues of nomenclature, classification and the universality of its categories of disorder. Responding to these challenges, psychiatrists drew upon the methodologies of epidemiology, in the process designing new instruments and practises which established our contemporary architecture of global mental health. Focusing on the practices and ideas of psychiatrists in India, Nigeria and Columbia, I demonstrate that physicians in postcolonial nations drew upon the tools of "western" science to answer different questions. These alternative concerns ultimately produced the concept of "expressed emotion" as a critical factor in the prognosis of schizophrenia. Unearthing the important contributions of psychiatrists in postcolonial nations to the emergence of global mental health, my presentation will seek to build bridges between postcolonial studies and literature in the history, philosophy and sociology of science.

When Scientific Fields Emerge: Tracing the Production of the Epistemology of HIV/AIDS *alexandre White, Boston University; Marina Richard, Boston University* How do disparate epistemic communities coalesce to form larger research fields? In this paper we chart the production of medical knowledge around HIV/AIDS in its earliest instantiations. Prior to the discovery of HIV, the virus now known to be responsible for Acquired Immune Deficiency Syndrome (AIDS) was recognized not for its root causative agent (a virus) but for weakening immune

systems and a group of rarely encountered secondary diseases that were killing those afflicted. As patients presented with a variety of different complementary diseases, various medical communities from oncology to veterinary medicine to virology and dermatology became linked in the search for the root cause of this immunodeficiency and these secondary illnesses. To examine how these fields combined to form the present field of HIV/AIDS research we collected citation data of all journal articles published between 1965 and 1990 on the major conditions, diseases and terms associated with HIV/AIDS in the period prior to the discovery of the virus in 1983. Using network and principle component analysis, drawing on co-citation, keyword and author networks, we examine how this previously unrelated set of scholarships from around the globe came together into a cohesive research field. In exploring how the centrality of this network shifts and by charting the dominant actors over time as well as an analysis of publishing dynamics such as the most productive labs, journals and countries, we sketch the dynamics of this developing research field before and after the discovery of the HIV virus.

Pharmaceutical Science in Action *Sergio Sismondo, Queen's University*

When pharmaceutical companies engage in marketing, they are sometimes creating networks and reshaping actors at the largest scale. These networks establish pieces of medical knowledge and make technologies effective. They also provide pathways that carry knowledge and energy that makes it move to where it is most useful to them. For the past decade, I have been opening black boxes in pharma's marketing/research structures and finding ghosts, zombies, sirens and trolls who make them successful. This presentation explores the skilled work that goes on to make those structures both black and boxlike. Black boxes take on a new appearance when we understand them as made so by phantoms. More generally, actor-network theory is a useful tool for understanding marketing at the largest scale. Seeing pharma at work allows us to see pharmaceutical science in action, but also to see pharmaceutical science put into action.

Session Organizer:
Leandro Rodriguez Medina, Universidad de las Americas Puebla

Chair:
Sergio Sismondo, Queen's University

183. E/valuative Actions: Exploring the Doings of E/valuation in Evaluative Systems 2
Papers for Open Panels/E/valuative Actions: Exploring the doings of e/valuation in evaluative systems
Open Panel
11:00 to 12:30 pm
ICC: E3.10
New forms of evaluation are reconfiguring professional and organisational life in ways we are only beginning to understand. Not only has the number of evaluations multiplied; multiple evaluative agencies often co-exist. Recent sociological research has therefore emphasised the empirical importance of focusing on the dynamics that occur when activities in an organisation become subject to multiple (sometimes competing) e/valuation registers (Brandtner 2017; Pontikes 2012; Stark 2009). This research also suggests that the plurality of e/valuation registers to which an

organisation is subject may actually strengthen the 'resilience' and 'creative potential' of that organisation. In this track, we wish to bring into awareness the multiplicity of e/valuation practices and how these influence organisational practices, including practices of knowledge production and healthcare. Expanding STS insights in the enactment of e/valuation in contemporary society, this track attends to evaluative actions; exploring the 'critical multidimensionality' of how professional work is assessed and configured numerically, verbally and visually through the use of metrics – both by 'outside' actors and practitioners themselves. Metrics allow for experimenting; using performance measurement to enhance healthcare quality, or arranging a more sensitive and nuanced process of intellectual production assessment in which metrics are embedded in wider practices of valuation (de Rijcke et al. 2016, Bal 2017). Yet, e/valuation may also involve strategic ignorance (Pinto 2015, Gross & McGoey 2015); rendering certain aspects invisible, while strengthening others. We are interested in these evaluative actions, and seek to raise questions about their practices and consequences for public and professional life. Questions that may be raised: How to analyse the complex relationship between evaluative knowledges and practices? Which valuation practices and commitments (professional, ethical, material) are we ourselves entangled with in our own work? What 'comfortable' and less fitting subjectivities are interpellated in certain evaluative systems? Whose voice is or becomes legitimate?
Participants:

E/Valuation in Designing Indigenous Services Delivery in Alice Springs *Matthew Campbell, Charles Darwin University*

The Integrated Services Program (ISP) is designed and delivered by Tangentyere Council (www.tangentyere.org.au), an Aboriginal organisation in Alice Springs. The program grew out of past programs delivering alcohol support services for Aboriginal people. It is difficult even to fully describe the services delivered under the ISP which are animated by a logic quite foreign to the world of services delivery markets. This leads to painful puzzles and serious problems in evaluating the program. In Australian services delivery markets, services delivery products are required to include elaborate plans for evaluative processes. The evaluation, as defined by the ISP funding contract defines two key types of program evaluation. First, an assessment of whether the program is working—in terms defined by the funding body (the state) which includes a requirement for enumeration. Second evaluation in terms that can inform the iterative re-design and development of the program itself is required. This paper begins with narration of a series of vignettes which will be followed by commentary that attempts to articulate an approach that might be called good-faith evaluation. This will include a discussion of Verran's approach to understanding the generation of numbers.

Indexical Judgment: The Construction of Valuation Devices for Art and Antiques *Erica Coslor, The University of Melbourne; Yuval Millo, Warwick University*

The growth of rankings, metrics and indicators is a hallmark of the modern economy and lifeworld of contemporary markets, but we know relatively little about the processes through which indices come about. For this, we focus on the case of fine art, as the special features of artworks as unique, difficult-to-value and values based on social consensus (e.g. Coslor, 2016; Coslor & Spaenjers 2016; Karpik 2010; Velthuis 2005) make the art market an excellent context to study creation processes for

complicated index measures. Using two pioneering art price indices, the Times-Sotheby and Sotheby Index, published by The Times of London and Barron's, respectively, we develop a theoretical framework to examine index development. Through interviews with key figures and an ethnographic corpus of newspaper and journal articles, we find the resulting shape of art indices motivated by epistemic beliefs held by designers and implementers, and by the organizational settings in which the index is developed. This leads to three key findings that contribute to studies of organizations and valuation: (1) the reductive nature of indices requires trust in a representative method, (2) the potentially conflictual set of conditions that this nature imposes on designers leads to politics, and (3) it also engenders spaces of competition and challenge, from rivals and critics. Our research contributes to research on organizational and calculative infrastructures underpinning markets and to the expanding valuation literature, a topic of growing interest in STS given links to the longstanding interest in calculation, classification and processes of scientific knowledge construction.

Metrics and the Commercialization of Open Access Scholarship
Alexandra Sharp Lippman, UCLA

In recent years, the ways in which scholarship is evaluated have increased and diversified. New, and often competing, metrics attempt to quantify and value knowledge in particular ways. The expansion of competing metrics may be increasing scientists' perceived pressure to produce. Open access publication attempts to respond to "pressure" by promising increased scholarly impact while also contributing to the proliferation of metrics, often specific to each platform or repository. While early Latin American open-access platforms such as Brazil's SciELO—which began in 1997—have, arguably, anti-capitalist or noncommercial origins, open access platforms are becoming commercialized. Corporations like ResearchGate and Academia.edu are privatizing open access on a global scale by transforming repositories into into social networks that capture value from social relations and social metrics. In this presentation, I explore processes of commercialization in open access scientific publication to illuminate how the non-market or anti-capitalist becomes legitimated market-based practice. I will trace changes in moral economies as they relate to emerging regimes of e/valuation as creative and knowledge-based industries shift away from intellectual property and ownership to an economization based on data, metrics, advertising and reputation. By using STS theories to address the relation of social order to knowledge production, this presentation explores changes in the relationship between scientific practice, publishing, and evaluation in transnational contexts.

Rethinking Academic Value: Experiments in Research Assessment with the 'Evaluative Inquiry' Approach *Thed van Leeuwen, Leiden University; Tjitske Holtrop; Sarah de Rijcke, Centre for Science and Technology Studies (CWTS)*

Recent years have shown a diversification of the criteria used for steering and assessing academic research, e.g. by including requirements to evaluate the societal relevance of research. In Europe, prominent examples include EU framework programs for research and innovation focusing on challenge-based approaches, and the role of societal impact assessment in the UK Research Excellence Framework. Both steering mechanisms are explicitly framed in terms of the role of science in and for society. In the Netherlands, the launch of a new Standard Evaluation Protocol (SEP) in 2014 reflects a similar trend. In addition to academic performance, societal relevance is now explicitly part of the protocol. This triggers new developments in assessing research, some of which have already been included in assessment procedures, whilst others are to be included in future practices. The evaluative inquiry approach can be used to design and streamline current and future assessments, shifting from reactive to pro-active behavior, and from accountability to learning orientation, towards a dialogic mode between evaluators and evaluatees. This paper addresses two actual assessments in the Netherlands, in psychology and theology, in which this approach was tried out. The approach situates academic performance within a wider variety of activities, interactions, outputs and audiences. This orientation allows for a rethinking of what and where academic value is. Steering away from describing academia by counting values, the evaluative inquiry is a tactics that follows value pathways, allowing us to ask questions about which worlds these pathways bring about and hold in tension.

Towards Meta Principles Based Evaluation Framework For Community Sustainable Transformation Programs *Saurabh Biswas, Arizona State University; Rimjhim Aggarwal, Arizona State University*

Socio-technical transformations are inherently uncertain, in possible pathways interventions can take, and their probable outcomes. Applying predetermined, output based evaluation measures can limit the learning space to narrow, quantitative insights and be restrictive in unravelling social change. Additionally, it makes evaluation "value free" and context independent. On the other hand, evaluation from a global normative values perspective may be too abstract for benchmarking or measuring change at an operational level. Functional socio-technical systems occupy this overlapping space between the two extremes, which can be characterized as the "messy" part of wicked problems, usually unaddressed in traditional evaluation frameworks. A three-tiered evaluation framework is proposed, which addresses these limitations. Empirical insights from transdisciplinary intervention experiments in a community based sustainable transformation project, "Rio Claro Sustentavel 2020" in rural Brazil, are used in this study. The top tier of this framework encapsulates a set of meta principles and operational measures of change are at the bottom. The middle tier, "governance layer," is the dynamic evaluative space. This consists of the social institutions (including social norms and practices) and the collective social learning processes, encompassing relevant stakeholders in a socio-technical change process. It underscores a methodological need, with a variety of modes and media, that include narrative, story, metaphor, and imagery, to engage with the often contested, dynamic and uncertain trajectories of transformations. This research demonstrates how individual and group behavior, as well as social learning and memory can be useful methods to measure socio-technical shifts.

Session Organizers:
Sarah de Rijcke, Centre for Science and Technology Studies (CWTS)

Iris Wallenburg, institute for Health Policy and Management
Tjïtske Holtrop
Roland Bal, Erasmus university rotterdam
Chairs:
Tjïtske Holtrop
Roland Bal, Erasmus university rotterdam
Discussant:
Helen Verran, Charles Darwin University

184. Producing Transformations: Drugs, Bodies, and Experimentation 2

Papers for Open Panels/Producing Transformations: Drugs, bodies, and experimentation
Open Panel
11:00 to 12:30 pm
ICC: E3.2

Throughout history, drugs and medications have been used to produce transformations. Experiments with different substances have taken place in diverse contexts: individual, subcultural, communal, scientific, medical, commercial, criminal/illicit and transnational. Despite the immense diversity and heterogeneity of these experiments, each is subject to specific norms, protocols, evaluative criteria, and concerns; and each often entails assembling publics to validate their findings or assess whatever emerges from them. This Open Panel invites papers about the transformations (intended or otherwise) associated with different practices of drug experimentation and consumption. Against commonplace understandings of drugs as stable entities with unique chemical properties that act to produce identifiable effects, the ontological turn in STS inspires a growing number of drug researchers to conceive the action of drugs and their purported effects to be produced in relation to various other actors, arrangements and networks. How do the practical arrangements devised to put drugs to the test in different places and times tally with the historical, cultural, technological and material processes in which drugs are implicated, and which undoubtedly mediate, extend, and complicate their effects? How are those transformations that extend beyond the experimental apparatus accounted for? What gets neglected? What criteria render specific experiments legitimate, and others illicit, and how are these criteria contested, changed, and/or adapted over time? What is unique about the adventures such experimental subjects undertake? What matters to them? What can be learned from situating their activities? How are their findings translated to other situations, and with what implications?

Participants:

Testosterone's Absence: Transgender Medicine and the 'Evidence of Treatment' *J.R. Latham, The University of Melbourne*
In this paper, I explore how practices of transgender medicine compel those people who seek female-to-male transgender surgeries to commit to using testosterone as a condition of treatment. While there are always ways people resist and exceed these controls, overwhelmingly, treatment guidelines and their application demand that trans patients adhere to stereotypical understandings of sex-gender through rigorous psychiatric scrutiny and medical surveillance. For trans men, this means narrating their life experiences and expectations in line with dominant understandings of maleness and masculinity, and aesthetically, by using testosterone to sufficiently appear to be nontransgendered. By drawing on notions of performative realities and ontological politics from science and technology studies (STS), I argue that these practices act in constituting sex, gender and 'gender dysphoria' as static, predetermined and independent of medical encounters. This paradigm also relies on and reproduces dubious forms of 'evidence' that gender dysphoria is a psychiatric disorder, erasing the necessarily complex ways trans people experience gender. Through research on mastectomies (surgical breast removal), I examine how access to treatment differs between nontrans men, trans men taking testosterone and those people designated female at birth who do not identify as men and/or do not take testosterone. By mobilizing philosophical insights from STS, I show how care for trans people could be improved by active engagement with individual interventions and patients, rather than as a package of pursuits that form a very narrow bridge of 'changing sex' from one stable sex category to the other.

Non-binary testosterone users: Re-making trans gender hormone practices *Rillark Zac Bolton, Gender & Cultural Studies, University of Sydney*
Within the context of trans masculinity testosterone is intimately, almost inextricably, attached to binary trans men. Testosterone is deemed the 'magic drug' that turns female appearing people into men, manifesting onto the external body the internal 'true' (male) self. It is the 'treatment' for being in the 'wrong body'. When testosterone is a substance that moves a person from one's assigned sex at birth as female into one's felt gender as a man how does one account for non-binary people's desire to use testosterone? Non-binary people occupy a gendered space that is neither strictly one, nor the other, of the apparent two binary gender options. Rather they reside outside of, between, or move through different attachments to gender. This paper centres the experiences of non-binary people who use testosterone to elicit some form of gendered body alterations. Attempting to grapple with the seeming contradictoriness of non-binary gender identities meeting binary gendered drugs, I explore the strong desires for some non-binary people to use testosterone, and the specific sets of imperatives for its use. I then look at how some non-binary people go about negotiating testosterone's gendering, how they may dissolve, circumnavigate and resist its tight attachment to binary trans men, and how these processes may allow them to envision their future selves and their bodies on testosterone. Finally, in thinking through an STS frame, I ask what do these new enactments of testosterone do to, and with, testosterone as a gender-effecting substance.

Medical Technologies and Decision-Making Processes around Gender Assignment of Intersex People in India *Arpita Das, Department of Gender and Cultural Studies, University of Sydney*
Medical technologies have a substantial impact on people's lives whether in relation to idea(l)s around beauty or health. Decisions around usage of medical technologies also have an enormous impact on the lives of intersex people who are often subjected to interventions including 'corrective' surgeries in their infancy to adhere to society's idea of the 'normative' gender. Performed for a variety of reasons, these interventions are often carried out throughout their lives. Even as medical values remain similar across countries in theory, practices often differ depending on socio-cultural and economic contexts. These differences are especially stark between the first world and global South country contexts. Analysing

qualitative data from ethnographic interviews with medical professionals from a range of specialisations and public and private health institutions located in seven different cities across India, I discuss how ideas around sex and gender of intersex people in India are guided by socio-cultural notions and expectations around gender, and explore the medical discourses that inform decision-making processes on gender assignment of intersex children. While medical professionals play a pivotal role in gender assignment of intersex people, and are presumably guided by notions of medical objectivity and neutrality, I argue that decisions on gender assignment in India are largely influenced by various socio-cultural norms and values that shape not just families' perspectives but also decisions made by medical professionals. Further, I suggest that conversations around justifiability of such interventions are multi-layered and must be understood in a nuanced manner within India's complex and complicated socio-cultural context.

Making naloxone: overdose, death, and community response in the United States *Peter J Davidson, University of California, San Diego*

Naloxone, a medication used to 'reverse' opioid overdoses, was first developed in the early 1970s and has been used extensively since in hospital and emergency medical settings to simplify management of opioid-related overdoses. Since at least the late 1990s, drug users in multiple countries have come up with ways of acquiring and distributing naloxone to their peers to allow drug using communities to respond to overdose without the need to involve emergency services, both to facilitate speedier response and to avoid mistreatment by emergency services and prosecution by law enforcement. As the 'opioid crisis' in the United States has unfolded in the 2000s, leading to opioid overdose becoming the largest cause of accidental death in that country, naloxone has been taken up by a new range of highly disparate groups. These include social support groups for the parents of people who have died from opioid use, law enforcement agencies, businesses where people frequently use drugs in the toilet or other private but publication accessible spaces, and government agencies. As each of these groups have taken up naloxone, the meanings and understandings of naloxone as an object have shifted to fit with differing understandings of 'addiction', 'drug use', 'overdose', as well as the meanings associated with the death of someone who used opioids. This paper presentation is based on 15 years of ethnographic field notes as the author worked on public health research, intervention design and implementation, and legal change around overdose prevention in the United States.

Dangerous Affinities: The Silences in and Commitments of LARC Promotion in the US *Jenny Dyck Brian, Arizona State University*

Long-acting reversible contraceptives (LARC) devices have become a ubiquitous symbol of reproductive freedom. Enthusiasm for LARC in the U.S. has given rise to new programs, policies and practices intended to promote their use and reduce unintended and teenage pregnancy, particularly among low-income women and women of color. Less visibly, LARCs have infiltrated the prison industrial complex, where prisoners may be coerced into LARC use. The seemingly heterogenous deployment of LARC warrants a critical pause to ask a

difficult question: how have technologies scripted with meanings of empowerment become implicated in programs, policies, practices that restrict freedom, discipline bodies, limit life chances? There is a category of persons for whom LARC are assumed to be unproblematic—teenage girls and low-income women— and thus LARC promotion becomes a legitimated form of social control. My project takes LARC promotion as the launching pad for what I frame as "dangerous" questions about technologies and users that are superficially discrete but (bio)politically linked through their scripted meanings and social consequences. I position the target(s) of LARC promotion as ethically adjacent to the chemically castrated sex offender. I don't conflate women encouraged to use LARCs with individuals convicted of sexual assault, but ask how the state's deployment of LARC and chemical castration reveals a shared—rather than divergent—commitment to "unproblematic" technoscientific biopower that both a) challenges traditional framings of reproductive agency, and b) exposes the limits of Foucauldian governmentality to account for recent manifestations of diffuse forms of state control.

Session Organizers:
Kane Race, University of Sydney
Kiran Pienaar, Monash University
Dean Anthony Murphy, University of Sydney
Chair:
Kiran Pienaar, Monash University

185. Critical Data Studies: Ethics and Human Contexts of Data Science II
Papers for Open Panels/Critical Data Studies: Human Contexts and Ethics
Open Panel
11:00 to 12:30 pm
ICC: E3.3
This is the second of three panels that address the human contexts and ethical impacts of data science. Its papers examine the way data is and is not a communicative bridge between disciplines, communities, and the public and private sectors.

Participants:
Competing, Collaborating, Compounding? Interactivity Between Public and Private Providers in China's Social Credit System *Shazeda Ahmed, School of Information, University of California- Berkeley*

Since 2014, the Chinese government and several of China's biggest technology firms have experimented with the creation of a social credit system in which data on web browsing, online purchases, social media, friend networks and a myriad of other behavioral and personal data sources are used to assign ratings of how trustworthy citizens are. Through discourse analysis of social credit policy planning documents, pilot project case studies, marketing materials, and Chinese news media coverage, this paper applies frameworks from the STS user studies, performativity, and valuation literature to analyze the models of compliance that state-run and privately operated social credit providers separately propose. How are social credit users and ratings co-produced in each of these models, and what assumptions are made about consumption of these evaluations as social capital? What are the ramifications for non-users? Using two widely documented examples—the Shanghai government's

Honest Shanghai pilot program and Alibaba spinoff Ant Financial's scoring product Sesame Credit —the paper deconstructs the divide between these public and private algorithmic scoring initiatives. Government data inputs (e.g., national debtor blacklists) into ostensibly private social credit services, along with the growing use of privately-issued scores to access preferential treatment in housing markets, healthcare, foreign visa procurement and other public settings, blur the boundaries between these two types of social credit. The paper concludes with an agenda for empirical studies of how the collapse of these boundaries may obscure the purported objectives of each type of evaluative system, potentially creating discriminatory outcomes in both.

From The Turing Test To The Trolley Problem: Tests, Measures And The Standardisation Of Machine Intelligence. *Maya Indira Ganesh, Leuphana University, Germany*

'Machine intelligence' has been known through tests and games, and being challenged by humans: from the Turing Test to Chess, Go, and Jeopardy; to driving cars and demonstrating 'ethics'. My research takes the application of thought experiments such as the Trolley Problem, which frames a popular media discourse on the 'ethics of autonomous driving'. But what does it mean for machine learning to pass or fail a [driving] test? And in relation to what standard? I theorise tests of machine learning as Barad-ian 'apparatuses', and follow the intra-actions through which tests are co-constitutive with machine learning as it is applied to autonomous driving. Automobility is a heavily regulated social activity, so my work is curious about the epistemic and socio-technical mechanisms by which tests intra-act with governmentality and regulation. I claim that despite anxieties about the need for regulation of AI through 'ethics', machine learning is in fact being trained to eventually become its own regulator through the very use of tests. Additionally, that there is a shift being made from 'ethics' to 'accountability' for crashes, and accountability is materialised through measures that enable standardisation. While standardisation manages a new and emerging technology, it also black-box-es it further within regulatory bureaucracies and codification under the law; and in doing so shapes 'objective' and normative notions of machine autonomy and agency. My paper will discuss these claims through the presentation of on-going fieldwork, and my own positionality as a researcher working with actors in the German auto industry.

The Ethics Ecosystem: Personal ethics and the governance of social media research *Gabby Samuel, King's College London /Lancaster University; Gemma Derrick, Lancaster University; Thed van Leeuwen, Leiden University*

This paper examines the consequences of a culture of "personal ethics" when using new methodologies, such as the use of social media (SM) sites as a source of data for research. Using SM research as an example, this paper explores the practices of a number of actors and researchers within the "Ethics Ecosystem" which as a network governs ethically responsible research behaviour. In the case of SM research, the ethical use of this data is currently in dispute, as even though it is seemingly publically available, concerns relating to privacy, vulnerability, potential harm and consent blur the lines of responsible ethical research behaviour. The findings point to the dominance of a personal, bottom-up, researcher-led,

'ethical barometer' for making decisions regarding the permissibility of using SM data. We show that the use of different barometers by different researchers can lead to wide disparities in ethical practice - disparities which are compounded by the lack of firm guidelines for responsible practice of SM research. This has widespread consequences on the development of shared norms and understandings at all levels, and by all actors within the Ethics Ecosystem, and risks inconsistencies in their approaches to ethical decision-making. This paper argues that this governance of ethical behaviour by individual researchers perpetuates a negative cycle of academic practice that is dependent on subjective judgements by researchers themselves, rather than governed by more formalised academic institutions such as the research ethics committee and funding council guidelines.

Mapping Silences, Reconfiguring Loss: Practices of Damage Assessment & Narratives of Repair in Post-Earthquake Nepal *Robert Soden, University of Colorado Boulder; Austin Lord, Cornell*

This research is a critical investigation into the informatics of damage and loss. In the aftermath of major natural disasters, governments, aid agencies, and affected populations all engage in practices of sense-making to gauge the extent and severity of the crisis, guide response activities, and plan recovery. To understand the conduct and implications of these practices, we studied the information infrastructure supporting the damage assessment implemented by the Government of Nepal following the April 2015 earthquake. In addition, we studied post-disaster recovery in the Langtang Valley, one of the hardest hit areas of the country. We argue that the informatics of post-disaster damage assessment in Nepal played a primary role in narrating the events of the 2015 earthquake, legitimating particular practices of recovery in the aftermath, and ultimately limited opportunities for the constructive reconfigurations of social life that emerge during disasters. This research demonstrates that the forms of sense-making afforded by information technologies play central roles in determining the practices of infrastructure repair following crisis and breakdown. We offer a detailed case study of how data standards, when designed to serve priorities of the state, can undermine local agency in ways that can be surprising or challenging to predict.

A computational study on the fame of great minds in physics *Guoyan Wang, University of science and technology of China; Tang Li, Fudan University*

Books are the stepping stones to human progress. The current study utilizes both Google Books, which covers 36 million global digital books, and Google Scholar, which indexes 91 million academic items, to examine the scientific fame of top physicists. Such a large collection is undoubtedly a rich archive of human history and civilization. Although some pioneers have utilized the Google Books corpus and conduct text-based statistical analysis to trace cultural trends, books have not captured sufficient attention in quantitative research evaluation. We particularly focus on and compare two of the greatest physicists, Isaac Newton and Albert Einstein, depicting their fame evolution over centuries and exploring what they are famous for. We reveal that the great minds are gone but not forgotten. Early scientists are still on the public's lips in modern society. Their scientific impacts

on human history have persisted for centuries. The computational analysis confirms that the influence of Albert Einstein is highly relevant to his two contributions on general relativity and quantum theory, while the most frequently mentioned scientific achievements of Isaac Newton are the law of universal gravitation and the laws of motion. We also explore their most accredited achievements based on co-word analysis. We find evidence in support of own-group fame preference, i.e., that the scientists have greater reputations in their home countries or among scholars sharing the same languages. We argue that when applied appropriately, scientific fame can serve as an altmetric indicator to gauge the influence of scientists beyond academia.

TRANSlations Over Supermarket Loyalty Program Database: More Than Empowerment, Enchantment And Profit *Maria Cristina de Oliveira Cardoso, UFRJ - HCTE; Marcia de Oliveira Cardoso, UFRJ - HCTE*

What is the value of a database resulting from a supermarket chain consumer loyalty program? Can you imagine the paths traversed by information you make available to the supermarket at the time you make your purchase and identify yourself as a loyal customer? A few years ago, some supermarket chains in Brazil launched loyalty programs for their customers, that consisted in accumulating points in accordance with the amount spent on purchases. In order to be entitled to the discounts the customers had to identify themselves at the time of payment. Over the years, attempts were made to individualize promotions based on the profile of the consumers. Nowadays, after several years of accumulating information about the consumers, applications for mobile phones were introduced in this supermarket-consumer relationship. These apps promise to individualize the promotions with specific products targeted to a particular consumer. This new relationship could create adjustment to the supply chain and to the management of the supermarket, at the same time these consumers deal with technology as a bargaining chip. These databases are assets. Are these apps black boxes allow, at the same time, a supermarket-consumer relationship and a betrayal? The higher the individualization is, the better the data quality. Do supermarkets want to empower consumers or do they aim to maximize profit? This work presents an analysis on translation over the apps. The analysis will seek to understand these apps and how loyalty program database is incorporate at the supermarket management and the consumers life.

Session Organizer:
Laura Noren, Obsidian Security

186. Smart Homes in Everyday Life: Gender, Nation, Intimacy and Expertise
Papers for Open Panels/Smart homes in everyday life: Labour, leisure and pleasure
Open Panel
11:00 to 12:30 pm
ICC: E3.4
Part 1 of the Smart homes in everyday life: Labour, leisure and pleasure panel.
Participants:

A history of household engineering *Melissa Gregg, Intel*
How did home-makers learn to operate the first wave of

industrial technology? Who were the pioneers of domestic science? This paper takes an historical approach to unpack the intellectual and industrial foundations for today's smart home. A popular lens is needed to find this history – a mix of gender, cultural studies and STS methods. I consult the considerable tradition of housekeeping manuals by women to build a critical framework for the productivity practices that continue in domestic space today. A selection of published materials and industry artifacts will be used to illustrate how homes became subject to specialist knowledge and complex infrastructures that were women's obligation to run. Home economics involved taking the domestic sphere seriously as an enterprise, complete with managers and employees whose roles and responsibilities included the appropriate adoption of new technologies. My discussion will consider the lasting influence of home economics and those who instituted the focus on domestic life as a science. Ellen Richards, Christine Frederick and Lillian Gilbreth all wrote books and industry guidelines that became the basis for popular practices of 'household engineering.' These women are the little known precursors to the industry ethnographers of technology companies today. Their example shows what is at stake as the smart home industry seeks solutions for longstanding efficiency problems while remaining oblivious to the changing activities of women over the course of a century.

Bitches With Glitches: How feminised devices fail and how we can do better *Jenny Kennedy, RMIT University; Yolande Strengers, RMIT University*

Meet CLOi. She's pleasant, helpful and available at an affordable price. Millions of contemporary households are now flocking to the smart home market as a solution to increasing domestic pressures, responsibilities and unfulfilled needs. Focusing on digital voice-assistants and home-based sex robots, we establish how feminised digital devices embody stereotypical gendered roles, and pay closer attention to their compliant, amiable and slightly stupid personalities. Research reports, blogs and dinner conversations are full of humorous stories about their glitchy and ditzy performance. CLOi reported had a 'bad day' at her launch in January 2018, giving LG's male executive 'the silent treatment' (Matney 2018). In this paper, we ask how the feminisation of these devices reinforces and undermines progress towards gender equality in contemporary patriarchal societies. We examine how people treat and respond to feminised devices in sometimes hostile and disrespectful ways. Framed as 'bitches with glitches', we warn that feminised devices could become the renewed subjects of use and abuse in domestic environments, reflecting the sinister and disturbing ways in which women in (and outside) the home have been treated throughout history. While it's also possible to imagine many benefits of these feminised devices - for companionship, care and intimacy – we argue that their current feminisation reinforces unhelpful gendered stereotypes that have so far been mostly ignored in commentary and scholarship on the smart home. We conclude by offering constructive suggestions for alternatives and improvements, and identifying some positive examples of devices designed with respect.

Hey Google! Do you love me? The imagination, design and experience of smart voice assistants *Justine Humphry,*

University of Sydney; Chris Chesher, University of Sydney
Homes around the world are echoing with conversations between people and their so-called smart voice assistants. Conversing with computers by voice is a mainstay of science fiction, an aspiration of technologists, and has recently been manifest in high profile AI personas Siri, Alexa, Cortana and Google Assistant. In this paper we reflect on the command and conversation relationships established with these systems, and the privileging of speech and voice as supposedly the most natural means of human-computer interaction. This paper draws on cultural history, textual analysis, conversation analysis and technology studies to examine this technocultural form. We analyse the archetypes established by well known conversational computers in cinema from HAL to Her. We examine patents, blog posts, academic books and journal articles on voice user interfaces (VUIs), intelligent agents and the design of personas. VUI design is a new discipline and form of labour involving AI programming and creative authoring, using data and 'chit chat' drawn from everyday users. Designers of voice assistants have been influenced by humanities and social sciences work, such as speech act theory, Grice on conversations, Nass and Reeves' work on 'the media equation' and Goffman's 'frames' and 'social roles'. While designers claim voice is natural, and are localised to national contexts, we suggest these systems remain tailored to dominant cultures, insensitive to speakers with 'accents' of all kinds. With only a small number of US corporations dominating intelligent agent services, this creates new forms of cultural imperialism, media concentration and soft power.

Second sheds: exploring the edges of Australian smart home households *Yolande Strengers, RMIT University; Larissa Nicholls, RMIT University; Jenny Kennedy, RMIT University*
Considerable attention has been paid to the benefits and uses of smart home technologies. Less scholarship has focused on the ways these devices are transforming the domestic spaces within and around the home, and the leisures and labours taking place within them. This paper follows Bell and Dourish's (2007) call to use the lens of the quintessential Australian shed to think about the digital home's 'edges rather than its centers'. We draw on findings from a three year ethnographic project conducted with early-adopting Australian households who self-identify as living in smart homes or using related devices. Focusing on the mostly male instigators, installers and troubleshooters of smart homes, we identify and discuss the 'second sheds' these men set up and manage. No longer confined to the backyard, second sheds encompass home offices; cable cupboards, basements and walls; bedside projects; and control rooms, where the 'back end' maintenance, tinkering and sometimes creation of the smart home takes place. We argue that the masculine, improvisational and creative characteristics of these 'sheds' are bleeding into traditionally feminised domains inside the home - and also being pushed into the home's other 'edges', like basements, attics and garages. We conclude by speculating on how the spaces and activities of these second sheds are being negotiated in smart home households as legitimate (or illegitimate) forms of work and play, and what this might mean for changing household dynamics.

Session Organizer:
Yolande Strengers, RMIT University

Chair:
Melissa Gregg, Intel

187. Concepts and Practices of ELSI: 2. Practices Beyond ELSI?
Papers for Open Panels/Concepts and Practices of ELSI: Exploration of its plurality
Open Panel
11:00 to 12:30 pm
ICC: E3.5
This is the second of the two open-panel sessions on "Concepts and Practices of ELSI: Exploration of its plurality." Almost three decades have passed since the program on ethical, legal, and social implications/issues (ELSI) was first conceived in the United States as part of the Human Genome Project. Scientists and policymakers increasingly accept the idea that major scientific breakthroughs and development of novel technologies ought to be accompanied by discussion on their ELSI. This trend has also provided a potential platform through which scholars of social sciences and humanities, including those specialized in the field of STS, can engage and, in some instances, critique what is being done in a laboratory and beyond. However, understandings of what counts as ELSI as well as practices intended to address it seem to differ considerably across places, times, and topics. The sessions aim to explore such plurality of ELSI – in terms of both its concepts and practices. This second session focuses on interactions of multiple actors around ELSI concerns. Despite the increased acceptance of the need for ELSI discussions, routes by which such discussions can inform practices of scientific research and technological development are not necessarily clear. In this light, more recent terms like Responsible Research and Innovation (RRI) call for integration of the discussions throughout the process of research and innovation. In this session, we explore how we might address the challenges of ELSI practice in the past and also whether STS has a specific role to play in its reformation.

Participants:
Artificial Intelligence and ELSI: What is the Role of an STS Researcher? *Arisa Ema*
The term "ELSI" has been used in ICT/AI circles in Japan since 2013. The author established an ad hoc network group called AIR (Acceptable Intelligence with Responsibility) with colleagues in 2014 and formed an interdisciplinary network to indicate problems within ICT/AI research and prevent problems from being overlooked. AIR was formed in response to the dispute that occurred in Japan in December 2013 when the Japanese Society for Artificial Intelligence (JSAI) journal cover design evoked a gender-related controversy. This dispute also urged the JSAI to build an ethical committee within the society in 2014 and it released its "Ethical Guidelines" in 2017. Outside of academia, the Japanese government is also eager to create research and development guidelines for AI. The government committee includes AI/ICT researchers, social science and humanities experts, and practitioners such as lawyers and NPO/NGOs in order to discuss the ELSI and R&D guiding principles. The author is involved in most of these academic and governmental AI-ELSI activities in Japan. In 2017, the author was awarded for significant contributions to science and technology. The award introduces the author's activity as "incorporating STS perspectives" with the academic and government communities by creating interdisciplinary and international networks and holding events including various interdisciplinary discussions.. These activities differ from the "traditional" definition of ELSI. By

introducing a network-based ELSI practice, the author will discuss the role of STS researchers and their social expectations on AI domain.

Integrating Law and Policy into a Large Technical Project: ELSI and the D2D CRC *Lyria Bennett Moses, UNSW Sydney; Louis De Koker, La Trobe University; Sanjay Mazumdar, Data to Decisions Co-operative Research Centre*

When the bid was being put together for a large research project to build better data management, storage and analytic tools for national security and law enforcement agencies in Australia, there was general agreement that a Law and Policy Program was essential. The real challenges arose after the bid's success and the launch of the Data to Decisions Cooperative Research Centre (D2D CRC). There are similarities and differences between the challenges faced by ELSI researchers and those faced by researchers in the Law and Policy program. Similarities include enhanced access to relevant communities, an underlying assumption that there is something good in the scientific or technical program (Juengst 1996), and a partially pre-defined research scope. A critique of ELSI projects with resonance for the Law and Policy program is the potential that legal researchers are categorized as 'naysayers' (Balmer, Calvert et al. 2016). There are also similar risks – influence by the funding body and becoming a "compliance check" rather than a research program of equal status (Viseu 2015). Opening up real interdisciplinary collaboration is perhaps the most significant challenge for both ELSI research and the D2D CRC. In both cases, there is a risk that ethical, legal or social research acts as an add on, separated from the daily work of technical innovation (Williams 2006). Ideally what is required is co-design of a socio-technical system, which has begun in "post-ELSI" work (Marris, Balmert et al. 2015). While it may be too late to do this within the D2D CRC, we are hoping to move to a post-ELSI model of collaboration between law and policy researchers and technical researchers in a future funding bid.

Stakeholder Attitudes Towards Theoretical Visions of Responsible Innovation: Implications For Policy Design And Implementation *John Pat Roberts, North Carolina State University - Genetic Engineering and Society Center; Jennifer Kuzma, North Carolina State University - Genetic Engineering and Society Center*

Contemporary debates within biotechnology over the last several decades, particularly concerning applications in food, agriculture, and the environment have been both contentious and polarizing. These debates have led to a rise in the number of social scientists working to incorporate nonscientific voices and views into the objectives of research and innovation and decision-making processes. The framework of Responsible Research and Innovation (RRI) has received considerable attention among social scientists for its use as a guiding ideal to realign current processes with outcomes achieved through participative mechanisms. The framework posits an inclusive and temporal decision-making process which relies on the reflexive capacity and responsiveness of institutions and organizations, and subsequently researchers and innovators, to responsibly manage emerging technologies. Evoking the "ideal type," the RRI construct for embedding responsibility into research and innovation requires goal alignment and mutual accountability between multiple sectors (or groups)

operating within the biotechnology space, including: the academy, industry, government, and NGOs. Responsibility between sectors, however, is directed by different and often conflicting goals. Utilizing a mixed methods approach involving structured focus groups and surveys, this paper analyzes the attitudes of each sector towards the conception of responsibility put forth by RRI, allowing for between sector comparison. These comparisons reveal tensions and barriers that must be navigated if RRI is to have an appreciable influence on both U.S. policy design for biotechnology and on restructuring of priorities for researchers and innovators.

Imaginaries of Emerging Technologies on Social Media: An Empirical Analysis *Daisuke Yoshinaga, Waseda University; Mikihito Tanaka, Waseda University*

The widespread use of the internet has brought greater changes in science communication, enabling the general public to participate in the process of interpretation, dissemination, and even generation of scientific information. Social media, in particular, is receiving significant attention from science communication scholars as a new platform that provides not only one of the few ways in which non-professional people can easily engage in conversations and debates and present their own opinions about socio-scientific issues such as social applications of emerging technologies. , But social media also allows scholars to observe how people think about certain scientific issues or science and technology in general, which had previously been difficult or took considerable time and effort to do in the analog era, in order to bridge the communication gap existing between professionals and non-professionals. With a view to constructing effective ELSI (Ethical, Legal and Social Implications) discussion, this study attempts to empirically identify and extract how people imagine the future that will be created by advancements in science and technology - social imaginaries of S&T - by analyzing references to several emerging technologies posted on Twitter, one of the most popular social media platforms, and employing the combination of social network analysis and both qualitative and quantitative content analysis.

Organic and Dynamic Library of AI Ethics for Engineers *Kaira Sekiguchi, AI Lab., Department of Aeronautics and Astronautics, The University of Tokyo; Koichi Hori, AI Lab., Department of Aeronautics and Astronautics, The University of Tokyo*

Although AI ELSI have been discussed a lot, engineers have hardly adopted results of AI ELSI investigations in their engineering activities. This is because ELSI's discourses are too abstract for engineering contexts and there is too much and various information to deal with together with their own work. In order to promote the engineers' utilization of AI ELSI considerations, we need some device to fill the gap between AI ELSI investigations and AI engineering. This is why we are building an organic and dynamic library that we call AI ethics library. "Organic" means that the library deals with complex relations among different AI ELSI discussed. And "dynamic" means that the library dynamically adopts new issues and helps engineers think in their own contexts. Therefore, AI ELSI will be accessible and workable in a form familiar to engineers. In detail, we adopt the general design theory which Yoshikawa proposed early in the 1970's in Japan, in which artifacts is

investigated. In order to connect the design theory to ELSI investigations, we redefine the lexicon and grammar in design, e.g., we introduce ethical terms such as "human rights" and "responsibility," and set rules to connect them in the description of network of changes that will be caused by designed artifacts. Then, AI ethics library provides the calculations of distance and relations among ELSI's different concepts, e.g., human values of IEEE's report, Asilomar AI Principles, and Japanese AI R&D guidelines. We have implemented AI ethics library and show the effectiveness in this paper.

Session Organizer:
Koichi Mikami, KOMEX, University of Tokyo

Chair:
Koichi Mikami, KOMEX, University of Tokyo

Discussant:
Yuko Fujigaki, University of Tokyo

188. Remaking Collaboration in Technoscientific Production
Papers for Open Panels/Remaking collaboration in technoscientific production
Open Panel
11:00 to 12:30 pm
ICC: E3.6
Participants:

Biodiversity Mappers: Collaboration as a Form of Gift Exchange *Per Hetland, Department of Education, University of Oslo*

Amateur naturalist recordings in the Species Observations over the last 10 years represent about two-thirds of the total recorded Norwegian species observations by both amateur naturalists and organized science during the last 200 years. It is therefore important to understand how different networks of enthusiasts take part in this global mapping activity. The activity of amateur naturalists is not a recent phenomenon, but has a long history in natural science (Conniff 2011). Digital technology, however, has changed the scale of amateur contributions. The mapping of biodiversity has become a huge collaborative enterprise between scientists, amateurs, and administrators across disciplines and organizational boundaries (Hetland 2017). As part of the large research project Cultural Heritage Mediascapes: Innovation in Knowledge and Mediation Practices (NRC, 2015-2019) that is studying citizen science, 20 amateur naturalists from three amateur societies were interviewed about their engagement in biodiversity mapping. In this paper, we aim to answer the following research question: How do knowledge infrastructures such as Species Observations facilitate reciprocity? To address important aspects of studying reciprocity, we also ask three sub-questions: (1) Who are the users of Species Observations? (2) How does Species Observations enable engagement and the building of expertise? (3) How does the infrastructure promote reciprocity? Our main claim in this paper is that knowledge infrastructures that facilitate reciprocity encourage longer-lasting engagement as well as both traditional science-based notions of expertise and new forms of lay knowledge (Mauss 1950 (2002), Harris, Wyatt, and Kelly 2013).

Thoughts On The Big Data Industry Innovation Ecosystem Based On The Collaboration Logic Of Block Chain Technology *迪 曹, Tsinghua University; 云昊 冯, Tsinghua Universtiy*

The Block chain is a kind of chained data structure which combines data blocks in time sequence, and the distributed ledger database is guaranteed by asymmetric encryption algorithm. The collaboration pattern of technological subjects has been changed by the demand of block chain's decentralization. At present, the development of big data industry in China is coming to a blowout. The role of data productivity is becoming increasingly prominent. What is more, it virtually closes the contacts among social subjects and penetrates into various industries rapidly. Moreover, it has begun to take shape in tourism, transportation, medicine and other fields. By analyzing the application of the block chain technology in big data industry based on different subjects' collaboration logic of the block chain technology and big data industry, this paper will present a comprehensive evaluation on the significance of the block chain technology to the industry development and the enlightenment to build and improve the industrial innovation ecosystem from the STS perspective.

What is a Discovery in Citizen Science? *Dick Kasperowski, University of Gothenburg*

In the past decade, science have turned to masses of online participants through open calls for generating and classifying very large sets of data. This paper reports from a study of the epistemic culture of an online citizen science project. Empirical data comes from one of the larger platforms for "people powered research", Zooniverse (July 2007), and the oldest project, the Galaxy Zoo. As a general approach, we drew on trace ethnography. This method is an extension to documentary ethnography that account for and take advantage of the particular conditions of digital practices. Firstly, we explored the values with which volunteers were mobilized into the epistemic culture of an online citizen science project and the central cultural values of discovery and discoverer emerged. Here we could observe that the participatory epistemic culture encompasses both distributed as well as more individual aspects of the epistemic subject. An essential feature of this mobilization takes place as participants are configured as an algorithmic collective to perform classifications, but with the possibility of individuality through the discovery of hitherto unknown phenomena. Thus, the epistemic culture values at least two forms of scientific discovery. Firstly, as a distributed collective, were no individual is assigned the discovery. Secondly, discovery can also be attributed to an individual having witnessed something no one else has. Thus, the outsider can be constructed to be on par with the scientist both in the form of a collective and as an individual depending on the nature of discovery.

Session Organizer:
Brian Robert Callahan, Rensselaer Polytechnic Institute

189. Well Years, Good Years, Quality Years – Calibrations and Aggregations of Daily Living: Temporalities
Papers for Open Panels/Well years, good years, quality years – calibrations and aggregations of daily living
Open Panel
11:00 to 12:30 pm
ICC: E3.8

Throughout the world low fertility, ageing and chronic disease are transforming how health/care is organised and practiced. Healthcare programmes are being reconfigured to address the challenges of treating and managing long term conditions just as

persons with chronic conditions, family members and loved ones grapple with daily tasks of (self-)care. In low fertility societies there are fewer young people to care for elders, who are increasingly living with various co-morbidities and may require assistance in their daily lives. A wealth of instruments, indices and scales have emerged which take daily living as their object. Despite their differences, their commonality lies in their normative differentiation of the activities of daily living along better-worse continuums. Certain ways of living are valued as of better (in terms of quality, fulfilment, life satisfaction, etc.), based largely on a person's functional ability, levels of experienced discomfort, and experiences of isolation. Contributors to this panel will critically examine how daily living, itself, has become the object of measurement as healthcare programmes, professionals, carers and patients seek to improve the daily lives of those living with chronic conditions. Ethnographic, policy-oriented and historical analyses of how daily living is made knowable and calculable on the one hand, and negotiated and tinkered with on the other, are welcome. The panel will contribute to STS scholarship on health metrics, health interventions and (self-)care and will further conceptual innovation at the nexus of medical anthropology, medical sociology and STS.

Participants:

On being a (future) statistic: Prognostication, visualisation and living-with advanced cancer *Katie Kenny, UNSW Sydney; Alex Broom, UNSW Sydney; Emma Kirby, UNSW Sydney*

Cancer – one of the leading causes of death and disease worldwide – has widely divergent outcomes. Some cancer types have minimal impact on one's life expectancy while others remain a virtual death sentence. As a result, relative survival chances feature prominently across the medical, cultural and lived experiences of cancer. In this paper, we explore how cancer survivorship is variously known, embodied and enacted in relation to the intertwined technologies of prognostic survival rates and visual imaging techniques. Drawing on qualitative interviews with people living with cancer, their carers and their health professionals, we explore participants' experiences of prognosis, (dis)identification with medical images, and embodied experiences of living-with cancer. In dialogue with recent scholarship drawing attention to questions of ontology across the fields of medical sociology, medical anthropology and science and technology studies, we focus on the experience of being in relation to prognosis in the context of a future made precarious by the diagnosis of cancer. Quantified prognostic outlooks tend to collapse the distribution of survival experiences into coherent unitary entities – to predictions of 'time left' and to survival odds expressed as a percentage chance over (usually) five years. While such numbers are a pervasive feature of the contemporary landscape of cancer survivorship, little scholarship has so-far investigated the affective dimensions of knowing-the-future in this way. We explore how dominant cultural and clinical configurations of cancer survivorship often privilege the upper 'hopeful' limit of such survival curves, and obfuscate the multiplicity of how cancer survivorship is lived, felt and enacted.

Happy Futurity on Ice: Sociotechnical Imaginaries of Frozen Ovarian Tissue as 'Quality of Life' Insurance *Anna Sofie Bach, University of Southern Denmark; Stine Willum Adrian, Aalborg University*

As chemotherapy is likely to damage the ovaries, and hereby the reproductive ability, female cancer patients are increasingly offered to preserve their fertility by freezing ovarian tissue. Paused in time, the frozen tissue awaits the recovery of the patient after which it can be thawed and implanted into the remaining ovary or the abdominal wall of the patient. As it revascularizes, the tissue restores the possibility of genetic motherhood as well as it promises 'natural' relief from symptoms of premature menopause. Based on ethnographic fieldwork among biomedical professionals and qualitative interviews with Danish women who had ovarian tissue cryopreserved, this paper analyzes how freezing of ovarian tissue is ascribed value as a technology that offers a better 'quality of life'. Combining science and technology scholarship with feminist cultural analysis, the paper employs the concepts of sociotechnical imaginaries and reprofuturity to analyze how the frozen ovarian tissue emerges as a form of bio-insurance that promises the repositioning of the cancer patient as a (re)productive citizen. The paper shows how ovary preservation, as an act of biopreparedness, is imagined not only to protect cancer patients from the unhappy future of infertility, but also to shield women from the discomfort and risk of menopause, a bodily state increasingly understood as a detrimental condition. Accordingly, the paper discusses how the potentiality of ovary freezing destabilizes the distinction between medical and social freezing as (premature) menopause is medicalized and becomes reversible.

Sensor technologies, place, and pattern in mental health research *Frances Shaw, Black Dog Institute*

This paper considers a trend in mental health research to use passive sensor data to detect mental health symptoms. In this model of detection "algorithms will be used to estimate new measures of mental state and behaviour based on digital data" (Glenn & Monteith 2014). Sensor apps can be used to detect activity, location (and therefore routine), and social connectivity. These emerging technologies represent a potentially powerful approach to predict mental health risk. Various terms have been used to describe the use of ubiquitous sensor data to estimate behaviours, such as reality mining (Eagle & Pentland 2006), personal informatics (Li et al. 2010), digital phenotyping (Jain et al. 2015, Torous et al. 2016), and personal sensing (Klasnja et al. 2009). Each of these different terms carries with it an imaginary of what data can do or of what can be done with data. My discussion here is concerned with these data imaginaries, as well as the question of what it means to determine risk on the basis of pattern or routine. What does it mean to fit to a pattern of risk or against a pattern of risk? Is it your deviation from an expected path that may flag you as "at risk"? Or does the creation of the data about ones everyday life change the patterns? What kind of effects will these flags or markers have on our lives, if this kind of analysis becomes the norm?

Tracking Failing Biologies *Ayo Wahlberg, University of Copenhagen*

Our biologies are constantly failing us, whether metabolically, immunologically, cardiovascularly, hormonally, neurologically or genetically. Such failure can span critical organ failure and uncontrolled cell division to milder aberrant immune responses that cause allergies. In this paper I use the notion of failing biologies to explore how living with (especially chronic) disease – morbid living – has come to be understood as a series of

constraints, limitations, discomforts and/or apprehensions which impinge on and shape daily living. Human biology is seen to fail individuals when, for example, shortening lifespans, impeding reproductive (or other) desires, diminishing 'quality of life' or hindering daily routines. As a consequence (bio)medical treatments often aim to arrest the (progressive) biological failure that can lead to the tissue damage that ultimately will impinge on an individual's (not to mention his or her family's and loved ones') daily life to greater or lesser degrees. If treatment is available and accessible, such conditions as cancer, kidney disease, HIV/AIDS, diabetes or lung disease can in many cases be managed giving rise to, what we might think of as disease-specific kinds of living. Millions of patients lead chemo-lives, dialysis-lives, ARV-lives or insulin-lives characterized by particular rhythms, disruptions, impairments but also possibilities and they are consequently able to (chronically) live with their disease for years if not decades. In conclusion, I suggest that medical anthropology and related qualitative health research have been central in the consolidation of knowledge of the kinds of living that follow in the wake of failing biologies, knowledge which is inextricably bound to healthcare practices aimed at improving the lives of those living with disease.

Session Organizer:
Ayo Wahlberg, University of Copenhagen
Chair:
Katie Kenny, UNSW Sydney

190. The Impact of Outsourcing and Contracting on Accident Prevention in Complex Sociotechnical Systems (1)
Papers for Open Panels/The impact of outsourcing and contracting on accident prevention in complex sociotechnical systems
Open Panel
11:00 to 12:30 pm
ICC: E3.9
Social studies of disasters in complex sociotechnical systems are well established (Challenger, Deepwater Horizon, Fukushima etc). Such events are best seen as 'organizational accidents'. Prevention requires a focus on how work is structured at an organisational level as described in high reliability theory and other similar theories of accident causation and prevention. Many of these theories originate in the 1990s or earlier. Since that time, the way work is organised has changed substantially with outsourcing / subcontracting becoming the norm. These practices introduce new forms of distribution of work and labour, and bring new spatial, temporal and inter-organizational boundaries that must be managed. The impact of global trends to outsourcing /contracting on the potential for disaster has been little studied. Keeping a complex sociotechnical system safe is a long term endeavour that requires more and more articulation of work between organizations. Such a 'dynamic non-event' poses particular challenges given the potentially short term and transnational nature of contract relationships and the variety of interests involved. This panel aims at better understanding how safety (and reliability) can be achieved in these distributed (and often singular) settings.
Participants:
Accounting for Accidents: The Precarious Work of Bangladeshi Migrants in Singapore *Karen Marie McNamara, National University of Singapore (NUS)*
Nearly one-third of the workforce in Singapore are foreigners who are not citizens. Most of these foreign workers are migrants from nearby countries who are low-

wage transient workers employed in the construction, shipyard, manufacturing, and domestic sectors. Work in the construction industry is considered to be one of the most dangerous jobs, with the most workplaces deaths. It is estimated that over 100,000 Bangladeshi citizens are working in Singapore, predominantly in the shipyard and construction industries. Using ethnographic methods and qualitative interviews, this paper focuses on the work injuries of Bangladeshi migrant workers in Singapore. If an accident happens on the job, workers can file for a work injury claim. When workers file a work injury claim with the government, they are issued a Special Pass that allows them to stay legally in Singapore while they are treated and wait for their medical claims to be processed, which can take anywhere from 3 months to more than 2 years. I argue that despite the regulation of workplace safety and injury compensation, the precarious nature of their work in the form of short-term contracts affects their willingness to report workplace accidents. I discuss what constitutes an injury and what counts as evidence to link injuries to work accidents, contributing to STS studies on translation, evaluation, and accountability.

Discussion on the Issues of Safety and Sustainability of Fragmented Systems *Myriam Merad, CNRS*
In today's private and public organisations world, systems' fracturing is an important problem. As a result of the increasing number of sub-systems and of a profusion of interfaces and interdependencies between them and between the actors of the system, safety practitioners feel submerged by their complexity. That have worsen the difficulty to embrace the question of how a failure affecting the system as a whole or affecting some sub-system can have an impact on safety and increase risks for the organisation and for the society. To the complexity characterizing technologies and socio-technical systems, an additional level of complexity was added by using more complex operating, management and governance systems. The original hierarchical structure in organisations is replaced by an outside contractual relationship. Therefore, a lack of direct control might result in a more difficult technical system management. This may induce the incapacity to identify problems and incapacity to enforce solutions. The profusion of contracts and of actors could be an expression of the explosion of the number of interfaces between the organisation and its contractors. We start the paper by introducing and discussing the two French approaches and the design and innovation principles to be able to stand by our conceptual framework. We will then introduce two situations in France where we diagnostic the fractioned systems in term of risk governance. The first situation is related to the railway transportation system and the second to a typical situation of outsourcing within an organisation. Then, we will discuss the conclusions of the diagnostics of the two systems using a historical and a chronological perspective. Finally, we will conclude on usefulness of systematically diagnosing current or ongoing fractioned systems regarding their risk governance.

Inter-organizational Collaboration for Railway Safety in Japan *Takuji Hara, Kobe University*
This paper is centred around the safety in a railway system in Japan. Shinkansen, the bullet train in Japan has been operated for more than 55 years without a serious

system accident. The rolling stocks are designed by collaboration between railway companies and independent railway vehicle manufacturers. This paper describes how railway safety has been achieved by the interaction between relevant organizational actors, material entities and institutional or structural factors. In addition, the paper also focuses on the blind spots of the assemblage since there was a serious incident recently in which a shinkansen with about 1000 passengers on-board kept running for about 740 kilometers with a cracked chassis. This paper adopts an original analytical method, called MAIS approach, which intends to elucidate social phenomena from the interactions among actors, material entities and institutional/structural factors. MAIS is an acronym formed from the initial letters of the elements of social phenomena, "material entities", "actors" and "institutional/structural factors". The MAIS approach pays clear attention to material entities, distinction between actors and material entities, and distinction between material entities and institutional/structural factors in comparison to the structuration theory and actor-network theory. The contributions of this paper are, firstly, the description of inter-organizational practices in the railway industry in Japan to shape safety; secondly, theoretical and practical implications for the safety studies about complex sociotechnical systems; and thirdly, the proposal of an effective analytical tool of social phenomena: MAIS approach.

How Outsourcing Impacts Safety Processes: The Case Of Nuclear Waste Storage *Anne Russel, IMT Atlantique*

Since the 1980s, organizations are not anymore seen as purely technical but as sociotechnical systems comprised of humans and technologies, which interact and cooperate under formal procedures and internal norms. The speed of life has also deeply changed the way people conceive and run their organizations: increasing technological innovations, intensification of information flux, multiplication of tasks and professions have given rise to complex sociotechnical systems that have become harder to manage with more and more components to coordinate. To face this complexity, many companies now employ the services of subcontractors, in order to reduce their internal costs and be more responsive to a rapidly changing environment. As a consequence, the development of outsourcing practices makes it more difficult for companies to ensure that the safety rules and procedures they have established are carefully followed by the subcontractors' employees. In France, for instance, the nuclear safety authorities cannot directly control the work of the external providers and temporary workers who are employed by the nuclear operators. Following this example, we propose to study the case of a French nuclear facility in charge of the storage of short-lived, low and intermediate level nuclear waste, where a large part of the storage activities is outsourced, while the design activities remain the core business of the managing company. Observing how the theoretical safety principles are first defined by the managing company according to its organizational culture, and then implemented and adapted by subcontracted employees within different professional groups, we will try to determine how the outsourcing can impact the employees' safety practices in their daily work.

Session Organizers:

Jan Hayes
stéphanie tillement, IMT Atlantique Nantes
Chair:
Jan Hayes
Discussant:
stéphanie tillement, IMT Atlantique Nantes

191. Environmental Risks in Transnational Contexts II
Papers for Open Panels/Environmental Risks in Transnational contexts
Open Panel
11:00 to 12:30 pm
ICC: E5.1

The environmental burden of China has increased to an unpreceded level. Various environmental risks, from the Beijing smog that often makes headlines in newspapers worldwide, to the widely polluted water and soil that significantly threaten people's health, and the growing waste incineration plants in people's backyard, have aroused public concern over their health and safety. According to Douglas and Wildavsky (1982), environmental risks are not objectively determined by scientific assessments. Our view of risk is socially constructed and culturally selected. In her edited book "States of Knowledge", Jasanoff (2004) also emphasized the idea of the co-production of science and social order. The understanding and perception of a scientific fact, such as risk, needs the support from a compatible social order. Risk communication with a public is never a pure intellectual process of accepting scientific knowledge. People experience this process in real social relationships, social interactions, and social interests. Their definition and judgement of risks are embedded in the whole social process. Drawing upon these foundational concepts and theories, STS scholars could delve into this area with unique approaches. The Institute of Science, Technology and Society at Tsinghua University, Beijing has been engaging in a wide array of studies related to air pollution, water pollution, waste incineration technologies, and other environmental risks in China. We are proposing this open panel to exchange findings and ideas with colleagues facing similar challenges in their societies.

Participants:

Monitoring as a tool for improving nuclear waste safety? *Göran Sundqvist, Department of Sociology, University of Gothenburg*

Geological disposal is today an internationally agreed solution for managing nuclear waste. The Implementing Geological Disposal Technology Platform, initiated by the European Commission in 2009, states that time has come to implement this agreed solution. Part of this ambition is the aim of passive safety, i.e. disposal without intention of maintenance or retrieval. However, the clear distinction between storage and disposal has gradually become blurred due to development of monitoring technologies, opening up for continuous vigilance. Interestingly, we find important differences concerning monitoring among European nuclear nations most close to implement their waste programmes: as a way to improve safety or as a threat to safety. In this paper, it is described how monitoring is assessed by European national nuclear waste programmes in France and Sweden, and the EU ambition to reconcile these differences and establish consensus on the role of monitoring for improving safety. In order to analyse this situation, ideas from STS are utilized, and specifically the understanding of consensus as a political goal. In other words, technical consensus, such as about geological disposal and monitoring, can

only be explained as a result of political ambitions, which these technological solutions also reinforce. This analysis tries to improve our understanding of consensus: why it is strongly pushed for by leading nuclear actors, how political and technical consensus are mutually supporting each other, and not least how an alternative view on consensus is needed, which not conceals the political choices involved when trying to establish agreements on technical solutions.

Inherent Safety and Development of China's High-Temperature Gas-Cooled Reactor *Guangling Xiao, STS Center at Tsinghua University, Beijing, PR China*

The research on China HTGR is carried out at the Institute of Nuclear Energy of Tsinghua University with the support of the government. After more than two decades of continuous efforts, China has mastered the core technologies and system design technologies, and the world's first commercial demonstration power station of high-temperature gas-cooled reactor has been built in Rongsheng Bay, Shandong Province. It is expected to generate electricity by 2018. There are many possible reasons why a HTGR can develop smoothly in China, of which inherent safety is the primary reason. The so-called inherent safety means that in any accident does not occur a large number of reactor core melting and radioactive release, to achieve the fourth generation nuclear energy system nuclear safety goals. This paper focuses on the role of inherent safety in the research and development of HTGR in China, and expounds and analyzes the cognition and interaction between scientists, government, enterprises and the public.

Social License to Operate in Nuclear Waste Management *Matti Kojo, University of Tampere; Markku Lehtonen, GSPR/EHESS, Paris & Universitat Pompeu Fabra, Barcelona & University of Sussex; Tuija Jartti, University of Jyväskylä; Tapio Litmanen, University of Jyväskylä; Mika Kari, University of Jyväskylä*

The past couple of decades have seen the emergence of the notion of social licence to operate (SLO). Originally developed by the mining industry as a mechanism to ensure its continued viability in the face of growing criticism and opposition against mining projects (Owen and Kemp, 2013, 29), SLO has over the years spread to many other industrial sectors. So far, the concept has not been picked up in nuclear waste management (NWM), despite the considerable efforts in this sector to nurture its relationships with possible host communities, including via the implementation of specific benefit schemes to encourage communities to engage in the siting processes. The SLO approach aims at helping developers to incorporate a model of consultation that engages local communities in ways that could enhance transparency and local support, and complement formal regulatory processes (cf. Hall et al. 2015). The paper analyses the forms of community engagement and benefit practices that implicitly or explicitly draw upon the SLO approach, as they have been applied in three forerunner countries in NWM: Finland, France and Sweden. We will explore the varying manifestations of SLO-inspired approaches across these different national political cultures, examining the community engagement and benefit schemes within their specific socio-technical configurations. Methodologically, the paper relies on systematic analysis of documentation and stakeholder interviews in the three countries. The paper makes a theoretically novel contribution by drawing insights from the literatures on SLO and community benefit approaches, and linking those with STS research on public engagement.

Waste Pickers and Invisible Labor in the Infrastructure of Recyclable Waste in Phnom Penh, Cambodia. *Kathrin Eitel, Institute for Cult. Anthropology & European Ethnology, Goethe-University, Frankf*

Waste is patterning streets and sewage systems in urban Phnom Penh, Cambodia. It's omnipresent and pervasive. Waste pickers collect what they find valuable and sellable or reproducible from the ways and paths, looping around dirty and smelly quarters. Without Phnom Penh's waste pickers, recyclable waste would sustain in streets. This infrastructure of recyclable waste is, as a lived infrastructure, highly visible in Phnom Penh's streets and stands against Star's assumption of break-down visibility of infrastructures (Bowker/Star 2000). I argue, that even though this infrastructure is on the surface, physically in the streets of Phnom Penh, visible, it stays at the same time blurry and hidden, insofar as other citizens or policy don't recognize them as a full-visible person with a "proper" and massively important job. Moreover, this infrastructural service stays unquestioned and is taken for granted. This leads me further to my assumption that not only infrastructures of recycling waste are sociocultural invisible but also the labor remains as a further aspect of it hidden. Eventually, the network of multiple infrastructures on recyclable waste and the network within them are influenced by different actors, as it is waste and waste pickers but also labor (Marx/Dobb/Ryazanskaya 1981) and in the area of interactions between others (Barad 2007, Dolphijn/van der Tuin 2012). My contribution to STS is therefore to question the idea of infrastructure as a structure graspable from only one perspective/ontology. Secondly, I'd like to bring the aspect of (un-)human labor as an essential actor to let infrastructure function and live into account. Methodologically I am using praxeographical approaches, ethnographical methods, like participant observation and interviews as well as mental maps and thick descriptions. Further, I'm following Star's (2016) suggestion on how to infrastructure and Larkin's (2013) inputs on politics and poetics of infrastructure. Sources: Barad, Karen (2007): Meeting the Universe Halfway. Quantum Physics and the Entanglement of Matter and Meaning. Durham: Duke Univ. Press. Bowker, Geoffrey C. and Susan Leigh Star (2000): Sorting Things Out. Classification and Its Consequences. Cambridge, Massachusetts u. a.: The MIT Press. Dolphin, Rick/van der Tuin, Iris (2012): New materialism. Interviews & cartographies. Ann Arbor: Open Humanities Press. Larkin, Brian (2013): The Politics and Poetics of Infrastructure. In: Annual Review of Anthropology 42/1, 327–343. Marx, Karl / Dobb, Maurice / Ryazanskaya, Salomea Wolfovna (1981): A contribution to the critique of poltical economy. New York: International. Star, Susan Leigh (2016): The Ethnography of Infrastructure. In: American Behavioral Scientist 43/3, 377–391.

The Amplification of Risk of Municipal Solid Waste Incineration in China *Yang Haihong, Institute of Science,Technology and Society,Tsinghua University,Beijing,China*

The generation of modern technologies are accompanied by many risks. As an environmental technology, municipal solid waste incineration technology brings new environmental risks while dealing with urban solid waste. However, as a technology originating in the West, it causes some new risks after it's introduction to China, or, the risks of the technology have been amplified or changed in new context. This Mainly reflected in four aspects: Different garbage characteristics lead to incompatibility of technology application; Garbage classification system is not perfect which resulting in poor technical effect; Non-standard operation and management of enterprises led to technology stigmatization; Government decision-making system is not perfect and the lack of it's regulation to enterprises leads to public mistrust. These mechanisms change the factual risk of technology and the public perception of risk and trigger the risk amplification in the new context of technology application. These risks are not caused by the technology itself but are closely linked with the social culture, norms, management and organization . Therefore, the risks of the same technology will be different in different social contexts. The judgment of technical risks needs to be combined with specific situations, that is, with the social order of the development of technology. The thesis is based on the fieldwork of case studies and the analysis of the existing literature, which helps STS researchers to understand the technical risks and the nature of technological development in transnational contexts.

Session Organizer:

Wei Hong, Tsinghua University

Chair:

chenggang zhang, School of social sciences,Tsinghua university,Beijing,China,100084

192. Public Engagement in Science and Technology Policy 2
Papers for Open Panels/Public engagement in science and technology policy
Open Panel
11:00 to 12:30 pm
ICC: E5.10

The massive promotion of certain emerging technologies and research fields is increasingly accompanied by measures that do not only observe and analyse a potentially unruly public, but also seek to mobilize and involve the public in the policy discourse. Deliberation and participation in technology policy, or simply "public engagement" (PE), is supposed to shed light on social and ethical aspects of future developments, to anticipate and defuse potential social controversies about these technologies, and render communication between decision-makers and the public more egalitarian and democratic. Participatory PE formats which have been developed to function as democratic and epistemic add-ons to established democratic procedures in specific national contexts have diffused into new national and transnational political-institutional contexts with new political and epistemic requirements and demarcations. This trend that is visible across the OECD and has brought about a wealth of social science theorizing and, often, the practical involvement of the social sciences in PE events raises several issues that will be examined by this panel. First, from a structural perspective, the following questions arise: which mechanisms explain why and how the trend toward PE manifests itself in different national political cultures? Is PE creating new epistemic and political demarcation lines between the public and the science and policy subsystems? Second, social scientists may be both the analysts and designers of PE events, and

mediators between society and technology. How can the role/agency of the social sciences in PE processes be conceptualized? Which role conflicts or normative dilemmas arise from it?
Participants:

STEP into the Future. Adventures in Technoscience Public Engagement in Australia *Alice Wendy Russell, Australian National University; Nicola J Marks, University of Wollongong*

In this paper, we will reflect on the STEP (Science & Technology Engagement Pathways) framework – a set of 'best practice' guidelines for public engagement - which was developed and tested by the Australian Department of Innovation, Industry, Science and Research between 2010 and 2013, as part of a national strategy for 'enabling' technologies. The authors, both STS scholars, were involved in STEP as a public servant managing the program (Russell) and as an STS expert giving advice and participating (Marks). Here, we consider STEP as a technology that sought to assemble actors, issues, understandings and conversations in new arrangements within a largely indifferent context. We trace the things that needed to be assembled and cared for in order to create and stabilise STEP. We consider the tenuous position of STEP, its marginal position in a policy 'side room' (Marks & Russell 2015), its ultimate demise; and how this fragile and delicate position influenced, negatively and positively, what it was able to perform. We will try, in this paper, to uncover aspects of the co-production of STEP and the policy and technoscientific developments surrounding it, including by looking at how things have played out since. We will go on to consider what is left of STEP, who still cares, and whether this is enough for it to be re-assembled, to re-emerge with a different life. What place might STEP have amongst emerging imaginaries and participatory storylines? How might it translate and transgress its national boundaries? Marks, N. & Russell, A.W. (2015) Journal of Sociology 51 (1): 97-115 Russell, A.W. (2013) Review of Policy Research, 30 (5): 566-587

The Modes and Mechanisms of Public Engagement in Science and Technology Policy in China — Based on Case Studies of Public Engagement in GM Crops *Chunliang Fan, Institutes of Science and Development, Chinese Academy of Sceicnes*

This paper studies the modes and mechanisms of public engagement in science and technology policy in China, based on public engagement in the Genetically Modified Crops/Food. Firstly, the paper analyses the ethical and social issues and the dynamics of public engagement in GM crops and summarize the modes of public engagement in other countries. Secondly, it explores historical development of public engagement in GM crops in China and summarize the characteristic. Thirdly, it makes case studies: four different events/modes of public engagement in China: (1) the widely, hot dispute on the transgenic rice between public and scientists during end of 2009 and early of 2010, when the Ministry of Agriculture issued a safety certificate for GM rice; (2) the consensus conference held in a small community in Beijing by Chinese Academy of Sciences, which was only an experimental activity and had not influenced on policy. (3) One person's participation, Cui Yongyuan — a famous TV man — against GM crops through his own effort by

taking video film. (4) Scientist and public dialogue mode. The paper makes a conclusion that formal mechanism of PM in S&T policy lacks in China as in other countries, although there are some practices and modes, and it explains the phenomenon by the following factors: policy culture dominated by government department; prevalent scientism in society; lack citizen organization.

Voluntarism as Public Engagement: the nuclear waste case *Darrin Durant, University of Melbourne*

Once upon a time, in the history of nuclear waste disposal, social activists of both academic and citizen stripes complained loudly that governance efforts to manage the nuclear waste problem were more like instances of bulldozing the public rather than engaging them in deciding on a course of action. But times have changed, and almost everywhere you look, nuclear waste disposal is the pin-up child for public engagement. The fashion of the day is now voluntarism, because obviously volunteering to let the most toxic substance on the planet be your neighbour is what any stable, secure, informed community would do. The sarcasm is intentional, provoking the question – I hope – of what social scientists should do now that the call to let publics in has been granted? Do we need to develop some methodological antidote to help us assess what counts as a victory co-opted? I'll briefly use the Canadian case as illustration, because it raises a distinct structural issue. Potential host communities are being excluded because of claimed 'geological complexities', but they also just happen to be failing the 'willing host' criteria. As analysts do we settle for 'scientized politics' as our explanation? Or is there something else going on, something deeper, about public engagement used as a measurement tool for complicity and a means to quietly suppress dissent?

Expertise in Public Engagement *Leah Sprain, University of Colorado Boulder*

For the past seven years, Boulder, Colorado has sought to meet climate action goals by creating a local electric utility. This process has included both robust community debate and closed-door meetings driven by lawsuits, concern over legal strategy, and bargaining positions. After a close election on whether to continue funding this effort, the city decided to convene a Communications and Engagement Working Group to analyze and provide guidance on engagement strategies on Boulder's Energy Future at least in part due to recognition, as the city manager wrote in an op-ed, of the "the perception that the city will simply double-down on traditional, one-way communication efforts in hopes of converting opponents of the utility" (Brautigam & Bailey, 2018). This paper draws on ethnographic methods to analyze role conflicts and normative dilemmas of the role of social science in public engagement processes by looking at the interaction and discourse within the working group. Through analysis of meta-communication about public engagement as well as the ways that expertise is constructed within the working group, this site offers insights into how social sciences contribute to public engagement, public engagement is professionalized, and how community members resist the professionalization of public engagement.

Session Organizers:
Franz Seifert, University of Vienna
Camilo Fautz, Institute for Technology Assessment and System Analysis (ITA)

Chair:
Camilo Fautz, Institute for Technology Assessment and System Analysis (ITA)

193. Transgressing the Intersection of Science and Food II
Papers for Open Panels/Transgressing the Intersection of Science and Food
Open Panel
11:00 to 12:30 pm
ICC: E5.2
Participants:

Scaling the Farm, Hacking the Farmer: More-Than-Human, Pericapitalist Farming in New York City *Wythe Marschall, Harvard University, Department of the History of Science*

Taking up the call to transcend a human-centric anthropology and document the mutual becomings of humans and nonhumans, I research urban indoor or "vertical" farmers in New York City, the plants that they farm, and the ever-mutating technics that they use to grow without soil, year-round. These projects are driven in part by entrepreneurs' desire to change consumers' and investors' relationships to agriculture—to de-essentialize the longstanding links between food production, rural land, and agrarian society. The very emblems of the neoliberal era of capitalism—the shipping container, warehouse, and "smart" monitor—are today the most basic resources, analogs for "land," and units of production for many indoor farms. They physicalize ideas about who should grow what foods, where. And they change human practices and temporalities of seeing, caring for, and thinking about plants. But what do hydroponic conditions do to the plants? What does it mean to "participate" with, say, arugula? One answer, drawn from my own "farmer" apprenticeship, lies in attending to the more-than-human quality of plant "production," which matters precisely because plant nature frustrates the timespace of industry: baby nasturtium plants bend toward the LEDs above them, tangling themselves with basil; lavender seeds sneak into the sites meant for chives; plants suddenly die, canceling out their value qua profit, when a pump breaks overnight. My paper will trace how indoor farmers promise to generate values within capitalist, environmentalist, and New Food discourses—and how the act of growing plants often exceeds these acts of value generation.

Superbugs and bad food: How antibiotic use in animal agriculture is framed in the Australian media *Heather Bray, The University of Adelaide; Sujatha Raman, The Australian National University; Carol Morris, University of Nottingham; Joan Leach, Australian National University; Rachel Ankeny, The University of Adelaide*

The use of antibiotics in animal farming is a contentious issue, mainly due to concerns about the development of anti-microbial resistance (AMR) and issues for public health, but also due to concerns about food safety and quality, and animal welfare. There have been studies of the issue in the media in other locales (for e.g. Morris et al. 2016 in the UK), and this study aimed to explore how the issue is being framed in the Australian media. Findings suggest that there is very little discussion of the issue in Australia compared to other locales, with AMR simply linked to the 'overuse of antibiotics in health and agriculture' and few articles going deeper. In addition,

SATURDAY

much of the discussion about antibiotic use in agriculture leading to 'superbugs' relates to overseas practice, and more of the discussion about 'superbugs' overall is about food coming in from overseas with resistant bacteria already on it. In articles that mention antibiotics and farming (and not AMR), there is an emphasis on them not being used for e.g. in relation to organic accreditation or producing "ethically" for niche markets, and hence "no chemicals, no hormones, no GMO no antibiotics" was used to describe 'good' food. The framing of antibiotic use in animal agriculture as a problem of food safety with imported food, or with food that is produced in less ethical ways, may limit opportunities for a more sophisticated conversation about the responsible use of veterinary medicines in animal agriculture.

Techniques of Containment in Salmon Aquaculture *Ignace Schoot, Memorial University of Newfoundland*

This paper aims to contribute to STS scholarship on containment, boundary practices, and spatialities. I use the case of containment in salmon aquaculture to learn more about what it means to contain. According to many opponents of sea-based aquaculture, there is a containment crisis in the salmon aquaculture sector. The open-net pens do not contain the salmon themselves, their parasites, their feed, and their waste well enough. Solutions to this crisis have been phrased primarily in terms of better containment through technological improvements or even 'closed-containment' on land. However, STS writing on remediation, waste flows, and biosecurity suggests that complete containment is an illusion. In order to understand what it means to contain in the salmon aquaculture sector, I went to both sea-based and land-based salmon farms in Canada, interviewed people trying to contain salmon (farmers, technicians, and maintenance workers), and read documents on the problem of containment in aquaculture (government reports, newspaper articles, industry texts, and activist pamphlets). In this paper, I focus on the multiple ways in which net-pens and containers are closed and opened in salmon aquaculture. To move away from the idea of containment as the total closing off of spaces, I argue that techniques of containment are material practices through which multiple insides and outsides are created, connected, and kept apart.

Transgressing the Intersection between Antibiotics and Food Production via Animal Health Management *Richard Helliwell, University of Nottingham; Sujatha Raman, The Australian National University; Carol Morris, University of Nottingham*

The use of antibiotics in food animals has long been a matter of concern on account of the potential implications for the rise and spread of antimicrobial-resistant (AMR) infections. Since the late 1990s, European policy frameworks in this domain have been predominantly framed around a need to curtail the animal-agricultural use of antibiotics which are critical in human medicine. These frameworks have in turn been resisted by actors mobilising arguments about scientific uncertainty of the kind familiar to STS scholars in a wide variety of cases. In this paper, we seek to problematise conventional policy framings of the relationship between antibiotics, food animals and AMR health concerns which effectively narrow the terms of discussion to science alone (as Martin 2005 has shown in the US context). We argue that these

framings produce a dichotomy between, on the one hand, scientific studies of resistance in the environment, and on the other, policy efforts to promote animal antibiotic stewardship in the interests of human health. In the process, the potential significance of AMR and antibiotic use for animal health in its own right, and the role of knowledge-practices in the diagnosis, treatment and management of animal disease are marginalised. Drawing on empirical findings from ethnographic work shadowing veterinarians, farm staff and scientists associated with a UK dairy farm, we unpack the reasons why attention to the mundane aspects of animal disease management could help open up new avenues for understanding and intervening in the space of antibiotic stewardship in food production.

Session Organizers:
Rachel Ankeny, The University of Adelaide
Heather Bray, The University of Adelaide

194. Climate Technologies and Unintended Consequences 2
Papers for Open Panels/Climate Technologies and Unintended Consequences
Open Panel
11:00 to 12:30 pm
ICC: E5.3

Climate technologies' can be defined as those technologies which are designed to help prevent or deal with climate change. This includes technologies such as renewables, biofuels, geoengineering, carbon trading, carbon capture and so on. The purpose of this panel is to explore the likely unintended consequences of these technologies for society, ecologies, other technological systems and so on, and the unintended effects of social processes on these technologies. What might we have to look out for? How do we factor in unexpected consequences? How do we limit such factors? Approaches from any theoretical and disciplinary perspective are welcome.

Participants:

Sustainable Biofuel Production through Emerging Applications of Bioremediation: A Perspective with Responsible Innovation *Jyoti ., Centre for Studies in Science policy, Jawaharlal Nehru University, New Delhi*

With the status of scientific and technology capability today, we have the means for unprecedented power at our disposal. However, as power increases, so does the intended or unintended new risks which can arise producing negative and global impacts through innovation. Technological solutions are emerging rapidly to address the current environmental issues like climate change, global warming, resource depletion and pollution (air, water and land). Bioremediation is emerging as an alternative technology to treat contaminated environment all over the world. The applications of bioremediation are explored not only as a solution to decontaminate polluted environment but also as a means to generate resource for energy production from biomass. Von Schomberg (2013), has noted that "the responsibility for the positive outcomes of the use of technologies evaporates once they are marketed (whereas responsibility for the negatives outcomes remains)". However, there is no formal weighing under public policies of the benefits of particular technologies versus their risks. This study has followed the framework of Responsible Innovation (RI) to map out such factors. The anticipatory measures on the likely or unlikely consequences of biofuels produced

though such innovations has not been much explored in the STS literature. Therefore, the central argument of this paper is based upon the right outcomes and impacts of research and innovation in the production of sustainable biofuel via bioremediation. An attempt has been made to explore what are the different processes to produce biofuel in general, what are the different processes to pursue bioremediation and how the innovations in this technology cater to the production of sustainable biofuel. The study has deployed survey of literature to find out the existing alternative technologies and different processes to produce biofuel. An integrated approach has been put forward in the form of inferences based on application of bioremediation for biofuel production while taking care of the environment.

Unintended Consequences of Climate Technologies *Jonathan Paul Marshall, UTS*

This paper lists and explores the unexpected or expected unintended consequences of some technologies developed to reduce climate change or mitigate the effects of climate change. These unintended consequences can be technological or social. For example, biofuels or biochar can lead to dispossession, deforestation, or increased food prices. Windfarms can disrupt people's sense of place and their environment at the same time that we are asking them to relate more carefully to the environment. Indeed the focus on climate change technologies can distract people from the other massive ecological problems we face. The lack of profitability also undermines the prospects of needed CO_2 removal technologies. It is suggested that all the problems of these technologies are magnified by normal capitalist distortions of information, and through a naïve faith in a market in which quality wins out. The paper suggests that technologies tend to present unintended consequences which disrupt any smooth transition and this is intensely influence by social factors, such as power relations and economic organisation.

Sustainable evolution of drinking water purification technologies at household level in India *Nazia Talat, Jawaharlal Nehru University*

In the case of a technology, sustainability has been understood at different levels, such as the technology being sustainable, the processes of production and use of the technology being sustainable or the overall vision of firms being sustainable. Although it is difficult to operationalise and come to a consensus on the boundaries of sustainability in various contexts, it is a highly popular concept, especially in the development related discourses. The technological choices made by consumers and firms are both influenced by the popularity of RO (reverse osmosis based water purifiers). This popularity may lead to path dependence or lock-in to RO because of information contagion. The global market of water purifiers is expanding at the rate of 10% per year (between 2013 and 2018) . The market of household purifiers in India is rapidly growing and is estimated to scale up to Rs 7,000 crore by 2015 as against Rs 3,200 crore at present. RO based technologies seem to dominate the purifier indstry in India. Research Questions: 1 Why are certain technologies adopted more than others? How did combination of technologies come about? 2 How is the debate on sustainability influencing the adoption and persistence of water purification technologies?

Methodology: Scientific papers, patent documents, interviews with firms and consumers, as well as content analysis of firm websites were done to understand the evolution of drinking water purification technologies at household level and the influence of sustainability debate on it.

Session Organizer:
Jonathan Paul Marshall, UTS
Chair:
Jonathan Paul Marshall, UTS

195. Global Animals: Science and Technology
Papers for Open Panels/Global Animals: Science and Technology
Open Panel
11:00 to 12:30 pm
ICC: E5.4

While much of the literature on nonhuman animals in science has tended to focus on model organisms in (mostly American) laboratories or the analysis of human-animal relations in laboratory settings, there is growing interest in studying the movement of animal bodies through laboratories across national and cultural boundaries. This nascent mode of analysis is crucial to understanding the ways that animal matter(s) continue to shape and define science and society far into the twenty-first century, even as the invisibilization of animals has seemingly accelerated within contemporary capitalism. This panel seeks answers to questions like the following: How have globalization and new technologies of movement and communication transformed laboratory animal science? How have novel assemblages of lab, field, ecosystem, and more shifted and blurred the traditional boundaries of scientific activity? How are relations between the Global "North" and "South" reconfigured and reinforced by the movement of laboratory specimens across geographical and national borders? Lastly, how do conditions of the 'anthropocene' or the 'sixth extinction' transform the nature and practice of animal experimentation? The panel seeks to bring together a transnational set of scholars studying the 'global animal' from both multi-national and multi-sited perspectives, shedding new light on this important development in science and technology.

Participants:

Arks, Freezers, and Gardens: Biodiversity Repositories in Toxic Landscapes and Planetary Futures *Anna-Katharina Laboissière, Ecole Normale Supérieure/Curtin University*

The ex-situ conservation of endangered species, animal or plants,domestic or wild, is a technique increasingly used to supplement conservation efforts on the ground, or to overcome the limitations imposed on species by severely disturbed and polluted landscapes. They can take various forms (zoos, aquaria, botanic gardens, the cryoconservation of gametes or seeds in banks, field gene banks), and involve the dislocation of ecosystem, niche, geographic range and individual bodies. Biodiversity repositories seem to be enterprises for fabricating what Latour has called "immutable mobiles": fixing the bodily becomings of individuals and species in the form of samples which can be moved freely at the cost of speciation and symbiotic relationships, they have the potential to ontologise biodiversity as dismembered genetic information according to colonial and late-capitalist inheritances. But repositories are also unruly collections of lively specimens and potentialities, plugging into disrupted metabolic relationships with landscape and planet and sometimes exceeded by the very bodies they seek to regiment. Archives of almost-

extinct pasts, static sedimentations of evolutionary presents and anticipatory devices all at once, they are sites for performing human-nonhuman relationships and ecological futures. These performances are particularly significant in the context of wide-ranging pollution, ecological disruption and rampant extinction, which trouble the stated conservation goals of ex-situ repositories. I will address the question of biodiversity conserved ex-situ from a philosophical-ethological angle, in order to investigate what forms of biosociality are severed, performed, reconstructed or made materially and discursively possible in the liminal space of the repository, that time capsule implanted in an encroaching . Understanding the types of worlding and the futures constructed through the specific regimes of care and classification at work in biodiversity repositories can unpack how multispecies relationships function through and with technological assemblages that are as normative as they are anticipatory.

Feeding the Flock: Wild Cockatoos and Their Facebook Friends *Eben Kirksey, Deakin University; Thom van Dooren, University of Sydney; Paul Munro, University of New South Wales*

Wildlife is persisting in urban areas of Australia even though white settler colonialism has resulted in the large-scale destruction of forested landscapes. While many bird species are in decline, one particularly charismatic species—the sulfur-crested cockatoo—has found emergent opportunities for flourishing within the built environment. Cockatoos are actively generating relationally constituted spaces, making urban ecosystems into "more-than-human" places with lively multispecies communities and abundance. Yellow tags attached to the wings of cockatoos, along with a smart-phone app and a Facebook page, have enabled citizens and scientists to collect data about bird movements. These tracking technologies were quickly coopted by an emergent public that began speculating about the personalities, relationships, intentions, and desires of individual birds. Interspecies friendships formed between humans and birds—involving shared understandings, emotional resonances, ongoing social exchanges, and utilitarian arrangements. People who fed cockatoos expressed the dominant view in Australia that providing food might be bad for birds, or would promote dependence on people. We found no evidence in the literature that commonly offered foods lead to obesity or ill health. Rather than corrupting wild birds, and making them tame, we found multispecies flocks were fleeting associations where wild and unruly behaviors redoubled as people offered up food. We found that wildness can emerge in intimate encounters with other species where risks intensify in close bodily encounters. Asymmetrical vulnerabilities and risks frame such corporeal interactions. Some cockatoos have been killed, after being identified as nuisance animals. Against the backdrop of these risks, we studied flocks of birds as models of and models for fleeting forms of association and collaboration. We found affects jumping from body-to-body, across species lines. Feelings of interspecies attraction, quickly alternated with agitated and uncomfortable experiences. Amidst these animated encounters, people are exploring the ethics of inclusivity and conviviality.

Moving birds in Hawai'i: Translocation and an ethics of creaturely movement *Thom van Dooren, University of Sydney*

In September of 2011, a delicate cargo of 24 Nihoa Millerbirds was carefully loaded by conservationists onto a ship for the three-day voyage to Laysan in the remote Northwest Hawaiian Islands. In subsequent years more of these birds made this same journey, part of an effort to establish a second population of this endangered species in response to the mounting pressures of climate change and new biotic arrivals, including predators, competitors, and diseases. But the millerbird is just one of the many avian species to become the subject of this kind of "assisted colonisation" in Hawai'i. Recent years have seen a broad range of efforts to safeguard the islands' few remaining endemic birds by finding them new, or returning them to old, homes. This paper explores these diverse efforts, situating them within the much longer, deep time, history of arrivals, speciation, and extinctions that have characterised this volcanic island chain. The Hawaiian Islands are living testimony to the marvellous capacities of plants and animals to move themselves; as each island emerged from the ocean devoid of life, living beings made their way to these distant places by wind, wing, and wave, and settled in. Engaging with the efforts of biologists, indigenous peoples, and activists to understand and contribute to these movements, this paper asks about the stories we tell about island animals' comings and goings, their roles and relationships, exploring the possibilities for an ethics of creaturely movement in this period of ongoing reshuffling and transformation of our living world.

Nature and Nation: Conservation Science in Aotearoa New Zealand *Courtney Addison, Victoria University of Wellington*

This paper draws on qualitative pilot research conducted in early 2018 on native bird conservation in Aotearoa New Zealand, to explore interconnections of nature, technology and the nation in this setting. In Aotearoa New Zealand, native birds are crucial scientific subjects. Their unique vulnerability and charisma makes them poster children for conservation science, as well as for the "100% Pure New Zealand" brand. Unlike 'traditional' lab animals, these species are often made highly visible in the service of science: for example, Sirocco the Kākāpo (a species of endangered, flightless parrots) is a 'spokesbird' for his species, and has his own Twitter account. As well as being highly visible, many of these species are also the focus of intensive conservation efforts, entailing population genome sequencing, translocations, and artificial insemination, as well as more traditional 'ranging' strategies. This talk mobilises the concept of imaginaries to speak to the pull of both a figure of the natural and the face of the nation in Aotearoa, where natural heritage is sustained and rebuilt through complex technoscientific means. In so doing, it highlights the ways in which conservation science is uniquely local and simultaneously global, positioning both native species and nation in an international traffic of biology, expertise, and technology.

The Colours of Seawater: Lenses and Rhythms in the Sea *Astrid Schrader, University of Exeter*

"Seawater", writes Stefan Helmreich, "prompted Boas to consider qualitative aspects of seeing". Reporting on preliminary results of a transdisciplinary conversation between a visual artist (Deborah Robinson) and a marine

scientist (Simon Rundel) and myself, this paper tries to link lenses and rhythms in the sea. We seek to draw attention to the limitations of human temporal experiences, which potentially compromise the ways in which we respond to the crisis in the sea, and ask for example how do the temporal rhythms of bodies of marine organisms, used to sensing in an aqueous world, get modified and adjusted to environmental changes? What emerge when ways of seeing become attuned to the interlocking of bio- and geo rhythms of organisms in intertidal zones and their alterations due to climate change. How do these rhythms interact with human experiences, scientific measurements and earthly cycles? For example, marine organisms inhabiting the intertidal zone adjust their body clocks to tidal cycles as well as the diurnal and seasonal cycles experienced by humans. How do the marine rhythms of life connect to planetary and terrestrial ones? Altering perceptions and cultivating new rhythms require transdisciplinary approaches and interventions. In addition to questions of time scales and interlocking of rhythms, we raise questions about lenses, literally and metaphorically. How could a prismatic ecology help to interrogate simultaneously the temporalities of scientific investigations and the materiality of its own lenses?

Session Organizer:
  Brad Bolman, Harvard University
Chair:
  Brad Bolman, Harvard University

196. Data Worldings and Post/colonial Connectedness II

Papers for Open Panels/Data worldings and post/colonial connectedness
Open Panel
11:00 to 12:30 pm
ICC: E5.5

Data infrastructures are producing unprecedented amounts of data and figures, advancing a primarily data-based understanding of worlds and compelling the coming together of different rationalities, imaginaries, economies and agencies in the pursuit of ever more integration across and connection between data. We suggest that current desires to apprehend a totalised world at all scales—including bio- and atmospheres, cosmos, inner spaces and outer surfaces of bodies—exclusively through data need to be understood as constituted in and through colonial relations and their shifting material realities. STS-inflected scholarship on data and data infrastructures has provided useful insights into making, sharing and mobilisation of data as efforts to govern the furthermost reaches of the "natural empire" (Bowker 2000) and into their participation in racialising asymmetries. With this panel we wish to further problematize emergent data worldings drawing on postcolonial critiques of the "universal" and "global" to examine how data worldings are contingent on and enact specific colonial relations. We also want to explore how attending to data worldings can help us understand the ongoing unfolding and transformation of neo-colonial logics and practices. How are data infrastructures entangled with and re-shaping colonial territorialities and histories? In what ways do data practices rely on the re-iteration or distortion of heterogeneous registers of colonial power, like expansion, standardisation, assimilation, aggregation and discrimination? Helping to contextualise these issues within historical perspectives and postcolonial theories is our discussant, Dr. Miranda Johnson from the Department of History at the University of Sydney.

Participants:

Border Data: Earthquake Scenario Work on the US-Mexico Border *Elizabeth A. Reddy, Colorado School Of Mines*
  How are data worlded in collaborations between experts in the United States and Mexico? Mexico has long been "on the periphery" of the elite technoscientific knowledge work associated with its neighbor to the north. The border between the two is meaningful in this sense. It also delineates distinct national infrastructures for collecting and analyzing environmental data. It does not, however, limit the effects of potentially deadly earthquakes. Since 2015, a bi-national volunteer team of engineers and emergency managers have been compiling and analyzing data from both sides of the border to produce a "San Diego-Tijuana Earthquake Scenario" document exploring dangers to the cities of San Diego and Tijuana in order to raise popular awareness and catalyze change. I draw on nearly two years of observation as a critical and active participant in the development of a scenario around a magnitude 6.9 rupture on the Rose Canyon Fault that could have severe consequences for the region. The team's collaboration entails coordinating data, analysis, and dissemination in order to make people in the region safer. However, in practice, their coordination is hampered by approaches to data and practice which privilege the tools and temporalities that the US-based team members work with. Recent efforts to address environmental data production, analysis, and communication in STS have centered issues of justice (see, for example, Dillon et al. 2017 and Jasanoff 2017). With this paper, I interrogate the conditions of possibility for just practices and uses of environmental data on the border. Referenced: Dillon, Lindsey, Dawn Walker, Nicholas Shapiro, Vivian Underhill, Megan Martenyi, Sara Wylie, Rebecca Lave, Michelle Murphy, and Phil Brown. "Environmental Data Justice and the Trump Administration : And Governance Initiative" 10, no. 6 (2017): 186–92. doi:10.1089/env.2017.0020. Jasanoff, Sheila. "Virtual, Visible, and Actionable: Data Assemblages and the Sightlines of Justice." Big Data & Society 4, no. 2 (2017): 205395171772447. doi:10.1177/2053951717724477.

From Amazon to Amazon with Trouble: Data Infrastructure for an Instrumented Forest *Felipe Mammoli Andrade, UNICAMP; Marko Monteiro, State University of Campinas*
  This text discusses the current endeavors for developing a data infrastructure for a major environmental experiment in the Brazilian Amazon forest, named Amazon-FACE (Free-Air CO_2 Enrichment). An international scientific initiative for assessing the effects of increased atmospheric CO_2 on the ecology and resilience of the Amazon forest. In short, it's an open laboratory, 20km north of Manaus City, for simulating an atmosphere from the future by pulverizing CO_2 through 30m in height pipes for 20 years in 9m radius "experimental sites" in the middle of the forest. It's expected that the experimental data produced can better inform prediction models for the Amazon future. For this to work as intended, as a data-sharing fiction across the many disciplines and institutions involved, the data infrastructure needed storage, connectedness and price only the dominant narrative of "high performant, scalable and invisible Cloud", like Amazon (the company), could provide. Except for a small legislation detail from Brazil, stating that all original data collected in Brazil must remain in

data centers in Brazil, even though copies could live in foreign countries. By foregrounding the otherwise invisible work of data infrastructure, this localized event helps us understand the ontological problem of how climate change issues become intertwined with data issues, and how one is constantly absorbed by the other. And by a series of interviews and observations I show how this assemblage enacts different inside/outside relations at every different location, be it on the laboratory, the database, the country or the forest.

Will Big Data Feed the World? Neo-colonial Futures and Capitalist Reconfigurations in Global Food Systems *Victoria Stead, Deakin University; David Boarder Giles, Deakin University*

In the shadow of the Anthropocene, global agribusiness firms and sectors of the development world seek to integrate Big Data into global food systems, with the promise of increasing crop yields, bolstering productivity, and reducing global hunger. This paper interrogates the larger data worldings and infrastructures associated with these instrumental projects in global agriculture, placing them into conversation with anthropological critiques of value and development. In doing so, we approach Big Data as both a sociotechnological phenomenon and an imaginative one, fuelling utopian visions of a 'proximate future' (Bell and Dourish 2011: 20) transformed through the digital. Drawing on ethnographic analysis of an agricultural research and industry conference on Big Data and food security, as well as ethnographic research with small holder food producers in Papua New Guinea, we explore three dimensions of the efforts to integrate Big Data into global agriculture: first, the ways in which they extend existing development logics (with their colonial underpinnings) into the digital realm; second, the ways in which they work to integrate small holder farmers in the Global South into global markets and value chains; and third, the transformations of human-environment relations and knowledges that they portend. The promises of Big Data thus hold existential implications for environmental worlds and postcolonial political ecologies, conjuring imagined futures that act politically upon the present. These futures redeem the aspirations of development and capital within hyper-rationalised digital modes of production, (re)producing neo-colonial governmentality and heralding an ontological reconfiguration of capitalist value in times of contemporary crisis.

Session Organizer:
Antonia Walford, University College London
Chair:
Tahani Nadim, Museum fuer Naturkunde
Discussant:
Miranda Johnson, University of Sydney

197. The Politics of Science and Technology in International Development 1
Papers for Open Panels/The Politics of Science and Technology in International Development
Open Panel
11:00 to 12:30 pm
ICC: E5.6
Participants:

American Modernization in India: Reinventing Development *Prakash Kumar, Pennsylvania State University*
The early postcolonial moment on the Indian subcontinent

reflected an admixture of thoughts and practices in an era of experiments towards "development." This paper focuses on the reimagining of instruments of development for agricultural and rural experiments of uplift in the 1950s and '60s that pursued determinate ends through planning. In collusion with American Point Four experts, agricultural economists, and communitarians, India's postcolonial elites sought to apply "technic" to raise productivity and to instill a groundswell of "a will to improve." Even as the tides of "modernization" swept the newly independent nation, starting with the entry of America's Point Four experts, a counter movement arose that challenged the latter's basic tenets. Specifically, the Gandhians in India fell back to defining the future nation in terms of the principle of Sarvodaya, literally meaning "uplift of all," - in a quest for building "democracy" against the claims of "development." Their moral critique was laden with an effort to unhinge technology from development and modernization. I analyze these competing narratives as contests to govern representations of colonial and post-independence history, and as attempts to determine the possibility and necessity of specific futures. The consultation of non-canonical vernaculars allows me to tap into the ideas of equality and social justice of subaltern groups that runs afoul of extractive strategies. The rise of economic reasoning in planning, the proclaiming of a public purpose, and the claim that economic knowledge spoke for all and could harmonize diverse social interests was resisted by those seeking new political imaginaries around "dignity." These groups used the lens of a "social" and pursued ideals outside the ambit of economic ends that both modernization and development promised to deliver.

Engineering Labor, Class Conflict, and State Building in Twentieth- and Twenty-First Century Industrialization and Development *Adelheid Voskuhl, University of Pennsylvania*
The social and political tensions of the "Second" Industrial Revolution around 1900 were national and global phenomena whose ramifications we can feel to this day. One exemplary class conflict was fought between engineers as a new profession as well as elite institution, and traditional elites that were rooted in pre-industrial ages (such as the aristocracy, military, traditional professions law/medicine, and senior members of state administrations). I propose a panel contribution that takes a fresh look at this conflict through the lens of colonial and post-colonial global politics, engineering labor, theories of "modernization," and development, for the pre- and the post-1945 eras. Throughout the twentieth century, engineers and traditional elites were struggling to define proper places for new engineering labor and expertise, invoking and imagining the work that engineers did, contrasting it to the work of traditional, pre-industrial elites. State administrations were not only key places where colonization and post-colonial modernization were thought up, designed, and executed; they were also the place where traditional bourgeois, male, elite identities were formed, specifically in early modern and modern Europe, but also in East Asia, South Asia, North America, and the Soviet Union. In my talk, episodes from this twentieth-century conflict serve as a background for analysis of current post-Cold War rhetoric, which makes claims about contributions that engineers make to the well-being of citizens, states, and global order, and the

ingenuity and selflessness this necessitates. I connect this rhetoric to its roots in state building and social contracts of the Second Industrial Revolution.

From the Maistry to the Computer Operator: Politics of Skilling and Development in Global India *Sreela Sarkar, Santa Clara University*

As India has emerged as a poster-child for ICT for Development (ICTD) initiatives in the global South, the Hindu nationalist Narendra Modi government is aggressively promoting ICT-led skills training initiatives for India's marginalized youth in global India. Under the Modi government, the largest state-run and supported network of vocational training schools, the Industrial Training Institutes (ITIs), are slated to be the most important sites for transforming subaltern youth into appropriate global workers for the IT-ITES sectors. Based on historical, archival research and sustained, ethnographic work in New Delhi, my paper studies Industrial Training Institutes as significant sites of producing modern subjects through access to technology. Drawing on debates in postcolonial, feminist, and STS studies, my research traces the linkages between communication technologies, industrial training, and Empire in India. I ask if there are consistencies and disjunctures in the introduction of communication technologies and the state's attempt to train the "Maistry" or "a higher type of artisan" in the nineteenth century in colonial India to the figure of the computer operator in the contemporary, "new' economy. Further, I examine media technologies as sites of pedagogical encounters between the elite and subaltern. I argue that both colonial and contemporary industrial training students critically interpret development messages in the context of their everyday lives in demanding an "education" versus "training" and in holding the state responsible for their welfare. Historical and ethnographic research on lived experiences is vital to critically examine the promise of the information economy for inclusion of marginalized communities.

Russian public policy and the scientific temper in nuclear India *Monamie Bhadra Haines, Nanyang Technological University*

Over the last decade, India has invested enormous political and economic capital to accelerate its nuclear energy transition by signing a series of bilateral agreements with nations to commence global nuclear trade for reactor technology and uranium fuel. While many scholars have concentrated on the role of the state and civil society in nuclear debates, what has been less studied is how transnational nuclear corporations address the challenges of grassroots mobilization against nuclear power in the Global South, widely seen as the cradle of the nuclear renaissance. In this talk, I interrogate how one major nuclear corporation, Russia's Rosatom, directly engages Indian citizens to disseminate a neoliberal permutation of the "scientific temper" as part of its larger public policy agenda, thus shaping India's political and epistemic landscape. Through newly inaugurated Russian Centers of Science and Culture in major Indian cities, Rosatom has partnered with local NGOs to create scientific literacy campaigns and opportunities for educational advancement. While Russia's efforts at exercising "soft power" are often excoriated as cynical and strategic moves to protect Russian interests while

consolidating new forms of power and influence in Indian society, I analyze these efforts to examine the contours of public discourse, circulating moral economies, and forms of social practice and performance that enable them to do so credibly among Indian publics. In other words, I attend to Rosatom's attempts to constitute polities favorable to the development of new nuclear economies to better understand how Indian democracy and nuclear power are being configured.

Session Organizer:
Shobita Parthasarathy, University of Michigan

Discussant:
Manjari Mahajan, New School University

198. Governing Toxic Waste 2

Papers for Open Panels/Governing Toxic Waste
Open Panel
11:00 to 12:30 pm
ICC: E5.7
Participants:

Living around nuclear reprocessing plants. Epidemiological controversies in France and in the UK *Laura Barbier, CERMES3*

This paper analyzes epidemiological controversies in the UK and in France and the way experts tackle the issue of the health effects of nuclear reprocessing on people leaving near the sites. During the Second World War, plutonium was produced from spent uranium fuel in the USA to equip the country with the atomic bomb. Reprocessing began in the UK and in France in the 1950s. However, as plutonium stocks were no longer needed for military motives, industrials have valued the assets of nuclear fuel "recycling" for civil applications. Reprocessing implies the discharge of gaseous and liquid effluents combining a great number of radioelements and chemical substances. Environmental activists have long denounced a global contamination of the ecosystems, but high visibility controversies arose when excesses of leukaemia in children living near the sites were publicly revealed. Activist groups have little invested the health field, occupied by professional epidemiologists who have proved unable to determine the effect of low doses of industrial effluents on human health. Moreover, leukaemia risk calculations rely on assumptions and models whom fundamental bases have not been opened to debate. I will examine how the issue of health consequences of reprocessing is addressed scientifically and publicly, in the light of the political stakes of this practice in the UK and France. I will show that knowledge production organized as a response to public controversies has been framed and used in a way that has prevented to make health risks visible and thus helped to maintain the status quo.

Politics of Toxic Waste: Mobilising Lay Expertise against Illegal Dumping in Taiwan *Mei-Fang Fan, Institute of Science, Technology and Society, National Yang-Ming University*

Illegal dumping of industrial waste has increased in Taiwan in recent years. This paper uses a new political sociology of science (NPSS) framework to explore the interplay of rules, networks, power, the science of waste circulation, and the results of local residents' fights against illegal dumping. A case of toxic waste on farmland in Chishang Township in Kaohsiung City,

southern Taiwan, is used to analyse complex relationships between governmental agencies and corporations. Additionally, this paper examines the mutually reinforcing interactions between regulatory policies and economic production and the resulting environmental victimisation. The research methods used are documentary analysis and in-depth interview. Competing knowledge claims among various actors are evaluated, as well as how differences in these individuals' social locations and social contexts affect their ideas of waste. Local residents found malodorous waste dumped on the abandoned farmland and numerous dead creatures, but the Environmental Protection Bureau of Kaohsiung City claimed that soil testing revealed no pollution. Civic groups expressed a suspicion that the government officials set their testing devices too far away from the dumping site and that their results were, therefore, inaccurate. Technicians from the Council of Agriculture tested the water quality and found that it was alkaline. They also discovered that the soil did not meet heavy metal pollution control standards. An implicated firm claimed that they were disposing 'products' made of recyclable and reusable waste materials. The firm argued that these 'products' do not pollute the environment and therefore did not need to be disposed according to the regulations outlined in the Waste Disposal Act. Local residents and civic organisations mobilised because of the environmental harm caused and sued the firm. The verdict identified that the materials dumped on the farmland were 'waste'. According to this verdict, the government bears the responsibility to ask the firm to remove the waste within a limited time. This case reveals problems resulting from flawed power structures, asymmetric resource distribution, and institutional policy failure. It also highlights the importance of local knowledge and citizen activism in toxic waste management.

RCA Taiwan and the Valuation of a Toxic Crime *Paul Jobin*

Some STS authors have studied the different forms of valuating an environmental disaster based on the cultural and legal context. But there is next to no study about how, within a given legal and cultural context, a collective mobilization might come to revaluate its own conception of labor, environment and human life. Collective litigation dealing with industrial pollution or occupational hazards—in the US, toxic-torts class action suits—presents fascinating cases of such revaluation. By the length of the litigation, the number of plaintiffs involved, the complexity of the toxic causation, and the transboundary character of the defendants, the long struggle for justice of RCA Taiwan's former workers-- and the groundbreaking verdict that they obtained in 2017--certainly offer one of the most striking precedents ever attained. Through a long and extremely complex legal, medical, and technical confrontation of expertise and experience, the plaintiffs and the defendants have been compelled to bring evidence that would confirm or refute the former's right to compensation for physical and moral damage. The plaintiffs/victims, i.e., the "polluted", have faced their defendants and former employers, the "polluters." Through that process, both sides have had to reconsider or reinforce their own moral "values": for the defendants, a temporary exposure to some toxicants worth just a few pennies; for the plaintiffs, an odious crime worthy of jail time. Both also have very different

perceptions of the labor-value involved. Some comparisons will be made with other collective lawsuits in Taiwan and in other countries, like France and Japan.

Session Organizer:
Soraya Boudia, University Paris Descartes
Chair:
Tania Navarro Rodriguez, Université Paris Descartes
Discussant:
Soraya Boudia, University Paris Descartes

199. Digital Sexualities, Biomedical Practice, and Queer Realities: HIV & Queer Mobility
Papers for Open Panels/Digital sexualities, biomedical practice, and queer realities
Open Panel
11:00 to 12:30 pm
ICC: E5.8
Participants:

How to Become HIV-Negative: Taiwanese Gay Men's PrEP Consumption and Sexual Health *Poyao Huang, UCSD*

This project investigates a new public health phenomenon: HIV-negative individuals who eschew existing medical systems to shop for HIV medicine PrEP – pre-exposure prophylaxis, or PrEP (a US FDA approved medicine against HIV infection)– in countries other than their own homelands. Using PrEP's arrival in Taiwan in 2015 as a case study, this project considers how contemporary local patterns of sexual health among men who have sex with men are shaped by medicine's various forms of economic and social values. Taiwanese implementation of PrEP reveals a global assemblage of consumption and bioethics by men who seek out cheaper generic forms of PrEP. Hospitals and clinics in Taiwan and Thailand are co-developing digital pharmacies to enable consumers to shop transnationally and receive medical examinations domestically. Drawing on science and technologies studies and medical anthropology, this project goes beyond public health's perspective of HIV-negative as a fixed medical category, examining how in these contexts sexual health is materialized and mobilized as various forms of practices and values. As we will explore, the story of PrEP is not a singular story of top-down implementation but an example of the local ways in which contemporary medicine is embedded in increasingly complex forms of distribution, consumption, and social practice.

Living Up to the Promise: Digitized HIV Advocacy Strategies among Gay Filipinos in Manila *Paul Michael Leonardo Atienza, Department of Anthropology, University of Illinois at Urbana-Champaign*

Recent scholarship about gay Filipinos on mobile dating apps highlight how these online platforms provide a space for sharing, connecting, and learning more about sexual identities not readily available through offline sources. But technologically deterministic fears and anxieties from various actors link mobile dating app use with the rise of sexually-transmitted infections, primarily HIV, among gay and youth populations in the country. Based on ethnographic data from over 16 months of multi-sited fieldwork in Manila, Philippines and its multiple online ecologies, this presentation focuses on everyday strategies among gay Filipino dating app users and local LGBT community advocacy groups involved in addressing social and moral values in the National Capital Region.

From a politics of visibility, online peer education, and offline plans toward changing local public policies, LGBT Filipinos and their community advocates in Manila simultaneously challenge and uphold prevailing ideologies from state, media, and faith-based institutions that insist on the connection between technology, sexual promiscuity, and the spread of sexually-transmitted infections. These strategies are specifically manifested in texts and images generated on dating app user self-making and communication, as well as shared stories that circulate through other forms of media. This project takes its inspiration from studies that examine complex formations between local, national, and global processes of gender and sexual subjectivities among transnational, LGBT Asian collectivities.

Problems, devices and designs in the construction of the gay sexual marketplace *Kane Race, University of Sydney*
Drawing on previous work in which I have approached digital sex as amarketplace and conceived hookup apps and online cruising sites as market devices, this paper argues that tech developers tend to rely on some problematization of the existing sexual marketplace, as it is being enacted, in their efforts to improve the prospects of specific groups of participants, qualify their products and secure a niche in the digital marketplace. Drawing on a rare interview with its founder, I discuss how the world's largest hookup site for men looking for other barebackers, BarebackRT.com ('BBRT'), was conceived and designed to address certain problems its developers perceived in the gay sexual marketplace as it was digitally and practically enacted at the time of the site's conception. Its innovations in format and search criteria demonstrate how clinical indicators, among other personal and technical specifications, can emerge as criteria for discriminating between prospective partners, populating personal profiles and qualifying the self in the pursuit of sexual encounters. More surprisingly, they now inform a growing range of apps and websites which propose to contribute to better HIV outcomes among MSM internationally. This demonstrates how innovations in digital culture can eventuate from convergences between digital and clinical media and how such convergences effect differences in the market qualification of social networking applications. But it also stages the categories according to which members are required to present themselves online as provisional, historically situated, and available to experimentation and critical transformation.

Session Organizers:
Stephen Molldrem, The University of Michigan
Jean Hardy, School of Information at University of Michigan
Roderic Crooks, UCLA Department of Information Studies

200. Latin American Science, Technology and Society: Women, Gender, and Sexuality Issues 2
Papers for Open Panels/Latin American Science, Technology and Society: Women, Gender, and Sexuality Issues
Open Panel
11:00 to 12:30 pm
ICC: E5.9

Latin American feminisms have addressed an array of historical, sociological, medical and other issues focused on women, gender and sexuality. These include historical and present day still–colonial enganglements of gender and sexuality with race, ethnicity, biological, pharmacological, medical and other issues about the treatment of women, men, lesbian, gay, and trans peoples. How do these issues effect government, economies, political activism and other social and cultural policies and practices? The focus is on issues IN Latin America, but also FROM Latin America. The emphasis is on making Latin America the subject of global thought, not just an object of other people's thinking. How does and should Latin American thinking, policies and practices have effects elsewhere around the globe, and how do policies and practices elsewhere have effects in Latin America.
Participants:

The Current Discourses Of Cyberfeminist Movements In Mexico-City *Mirjana Mitrovic, Freie Universität Berlin*
Cyberfeminists primarily act within the Internet, often regarded as a global virtual space without borders. However, the discourses of the Mexican cyberfeminists show that their actions are heavily influenced by the activists' local contexts. In Mexico-City the current cyberfeminist activism is marked by other autonomous urban feminist movements and the politics of the local PRD government. Additionally, "machismo" and violence against women from catcalling to assault to femicides impact the activists' lives on a daily basis. Within virtual spaces these phenomena reappear, e.g. in the form of "trolls" who insult, threaten and intimidate. Cyberfeminists thus inhabit the hybrid zones on the disappearing lines between virtual spaces and local physical world. Within this framework Donna Haraway's "Manifesto for Cyborgs" (1985), which also came to be the cyberfeminists' manifesto, remains relevant as it further questions these borders, particularly between human and technology, woman and man. In order to grasp these multiple levels of blurred dualisms and dichotomies of spaces and gender constructions, this discourse analysis critically examines the activists' media creations in form of text, image and audio-visual media as well as the press coverage about their actions from 2015 to 2017. Based on the thoughts of Michel Foucault and the method of Margarete and Siegfried Jäger the paper hence shows how current cyberfeminist movements interpret the hybridities surrounding them. Moreover it is analysed how the societal contexts influence their activism and what impact from the global virtual space onto the constructions of reality within the local population the activists can make.

Trans*Forming STS: Complicating the Head/Heart Division Through Ethnographic Travels *Sonja Jerak-Zuiderent, Amsterdam Medical Center / University of Amsterdam; Teun Zuiderent-Jerak, Department of Thematic Studies - Technology and Social Change, Linköping University*
With a renewed attention to geographic situatedness and colonizing and diffusionist tendencies within the field, STS scholars are struggling with diversifying their own knowledge production without reproducing 'inclusionist' discourse. In these struggles, 'regional' variation seems to dominate understandings of difference. One example is the proposal by Law and Lin (2017) to 'provincialize STS'. They argue that STS scholars trained in Euro-American theory and knowledge but with bodies inhabiting other geographic locations often feel 'beheaded' and argue for "reversing the STS terms of analytical trade" by moving notions 'from elsewhere' to European empirics. This paper explores another possible route: that of moving our bodies into empirics where we have to let go of our Euro-STS heads. We study the health for trans* persons that followed the radical Argentinian Ley de Identidad de Género and share our travels to four sites: a

health guide development meeting at the Ministry of Health in Buenos Aires, a Consultorio Amigable y inclusive in Chivilcoy, a general practitioner's office in Rosario, and an international trans* health conference in Amsterdam. Whereas the Argentinian gender identity law has shaken up legal arrangements in countries like Denmark, the Netherlands and Malta, the Argentinian practices stand in stark contrast due to their profound commitment to challenging binary understandings of sexuality. But sustaining those efforts after neoliberal reform benefits from the United Nations Development Program. Could such productive intertwinements of Latin American and 'International' activities give inspiration to diversifying STS without exoticizing 'other' concepts but opening one's heart to resonating alternatives?

Women, stars and science of the south. Female astronomers in Chile at the beginning of the 20th century. *Lorena B. Valderrama, Universidad Alberto Hurtado; Sanhueza Carlos, Universidad de Chile*

The historical study on the contribution of women to science and technology has been addressed in recent decades, questioning the role of historians because of their gender bias, excluding the contributions of women in their studies. These have been included only if they were famous influential scientists (Easlea, 1981 Alic, 1986; Harding, 1991; Haraway, 1995). In the case of astronomy, studies on the history of astrophysics in particular have made it possible to know the contribution of women in European and North American observatories (Kistiakowsky, 1979, Rossiter, 1984, Pérez and Kiczkowski, 2010). However, we do not know about South American female astronomers, calculus scientists and astrophysicists, who have been excluded from the local histories of these scientific institutions. This often occurred because their contributions have not been included in institutional reports or scientific publications. Controversies, however, allow us to open the black box of sciences and illuminate invisible practices and actants included in traditional sources (Latour, 1999). This paper analyzes the role played by the women scientists working at the National Astronomical Observatory of Chile and discusses the problems and controversies occurred in that institution under the administration of the German astronomer and professor of the University of Chile, Federico Ristenpart (1908-1913). The proposal is part of the Research grant "Looking at the stars of the south of the world: the National Astronomical Observatory of Chile (1852-1927)" (Fondecyt 1170625). The study is based on the revision of the press during that period and of the documents of the National Administration Archive.

Metaphors of Scale and Feminist Technosciences of More-than-Human Worlds *Laura Foster*

This paper discusses metaphors of "scale" for examining the co-constituted connections of legal, scientific, and human-nonhuman worlds, and for building feminist, indigenous, decolonial STS approaches. It draws its insights from ethnographic research in South Africa that simultaneously examined how a succulent plant native to the Kalahari Desert named Hoodia was reinvented through patent ownership, stereochemistry, pharmaceutical research, the self-determination efforts of Indigenous San peoples, Hoodia growing practices, contractual benefit sharing, and bioprospecting legislation, and that also asked how Hoodia plants interrupted the very forces of law, science, and the marketplace that differentially valued and sought to contain them. While metaphors of scale from chemistry and geology can help guide STS analyses of different ways of knowing (e.g. chemistry, farming, indigenous peoples' knowledge), nonhuman modalities (e.g. molecules, flowers, seeds), and the governing of knowledge production (e.g. patents, bioprospecting permits, benefit sharing agreements), they remain limited without the insights of feminist intersectional approaches that emphasize scale for analyzing how different ways of knowing, being, and doing in more-than-human worlds are valued differently in society. They also exist in tension with metaphors of scale from law as a machine for weighing, which can reduce STS analyses to a balancing of different ontologies, epistemologies, and responsibilities as competing interests that are singular and unrelated, thus offering a narrow future for social justice. This examination of the genealogies, limits, tensions, and possibilities of metaphors (and methodologies) of scale contributes insights for a feminist technoscience considering questions of more-than-human worlds, the subterranean, and the physical sciences.

"The imagined woman technoscientist": reflections on feminist technoscience studies *Knut H Sørensen, NTNU, Dept. Of Interdisciplinary Studies Of Culture; Sharon Traweek, UCLA*

Feminist technoscience studies have increasingly become a theoretically sophisticated approach to the analysis of science, technology and medicine – technoscience. This has resulted in critical accounts of the making and doing of gender in technoscience, including post-colonial and intersectionality-related issues. However, we argue that there are important limitations to the achievements. Above all, we are concerned with a bias of feminist technoscience of being based mainly on studies of and/or theorising from studies of biomedicine, biology and computer science or from philosophical claims about technoscience. We substantiate this claim by analysing what we call the imagined woman technoscientist underlying those important contributions. 'The imagined woman scientist' is our discursive construct that highlights widely held assumptions/beliefs about characteristics like professional and gender identities, professional interests and motives, exclusion experiences, gender politics, social responsibility, and relations to technologies and natural phenomena. Our point is to show, without being unappreciative, that most critiques of gender relations in/of technoscience, include unexamined assumptions about women technoscientists (such as being a force of change, representing difference, etc.). Usually, these constructs are generalized from little empirical evidence, if any. We then show how this bias has limited feminist theorizing of technoscience.

Session Organizer:
  Sandra Harding
Chair:
  Sandra Harding
Discussant:
  Laura Foster

201. 4S Business Meeting
Single Paper Submission
Lunchtime Workshop

12:30 to 2:00 pm
ICC: C2.4
Session Organizer:
  Kim Fortun, University of California Irvine

202. 4S Ethnografilm Program
Single Paper Submission
Special Event
12:30 to 2:00 pm
ICC: C2.5
Best of short films from Ethnografilm Paris. More details at Ethnografilm.com
Session Organizer:
  Wesley Shrum, Louisiana State University

203. Transformed Academic Careers
Single Paper Submission
Lunchtime Workshop
12:30 to 2:00 pm
ICC: C2.6
"In recent years, mobility, competition and precariousness have become new standards across the academic labour market. The associated transformations of academic identities and career norms are gaining attention as subjects of debates and research. This session provides a space for researchers studying academic careers to informally meet and share current and future research questions as well as conceptual and methodological challenges."
Session Organizer:
  Marie Sautier, University of Lausanne
Chair:
  Marie Sautier, University of Lausanne

204. Affordances and Architectures: A Materialist Approach to Digital Design 3
Papers for Open Panels/Affordances and Architectures: A Materialist Approach to Digital Design
Open Panel
2:00 to 3:30 pm
ICC: C2.1
The design of technological objects and systems cannot be separated from the social structures within which they arise and operate. People and things are mutually influential and co-constitutive. This simple idea—that people shape technologies and technologies shape people—undergirds recent advancements in affordance theory and platform/infrastructure studies. Across disciplines, scholars are developing precise language and robust frameworks for understanding how social dynamics are built into socio-technical systems and how socio-technical systems structure social dynamics. These theoretical advancements arise through and alongside critical work on digitization and automation as an integral component of personal and public life (see especially Nagy and Neff 2015; Plantin et al. 2016; Davis and Chouinard 2017; and Evans et al. 2017). This panel seeks to implement, build on, and apply clear conceptualizations of "affordance" to better understand how the architectures of digital platforms and infrastructures take shape and exert force. An affordance perspective on digital architectures fosters questions about the social antecedents to design decisions as well as questions about social and institutional effects. For instance, what is the interplay between administrative medical interfaces and physician-patient relations? How do dating apps with "swipe" functions (re)formulate intimacy and courtship rituals? What agendas are embedded in digital maps, and how do these mappings inform experiences of space and place? How do vote-based visibility algorithms encourage or discourage dissent? We seek to strengthen

a theoretical orientation towards the materialist study of digital design through serious treatment of technological affordances.
Participants:
  The ambivalence of corrective technologies: exploring subjective experiences and meanings of wearable tech *Gavin John Douglas Smith, Australian National University*
  This paper builds on empirical research I have been doing on the subjective dimensions of wearable tech and the embodied experiences of bioveillance, more broadly. It offers a detailed analysis of approximately 20 in-depth interviews I have conducted with wearable tech users in the health context about the diverse meanings they assign to the 'corrective' devices they must routinely bear on their bodies for the purposes of managing chronic illness. Using Lupton's (2016) notion of 'imposed' tracking as inspiration for the sample selection, as well as previous ideas I have developed (Smith, 2016; 2017) around the unseen work that data-proxies perform and necessitate, and their implications for bodily intuition, I contend that corrective technologies generate ambiguous outcomes for those subject to them. They provide certain affordances while simultaneously acting to govern the body and its interiority in new ways: in ways that often displace the embodied experiences and sensory systems of the wearer. Moreover, such technologies are situated within a wider set of political economies and socio-cultural relations which mediate their design, availability and uptake. Taken together, these meanings and factors have an important impact on whether such devices are perceived as enabling or constraining, how they are used in everyday life, and what consequences their usage excite.
  The Multiple Becomings and Affordances of Naked Selfie Loans *Jessie Liu, Australian National University; Helen Keane, Australian National University*
  'Naked Loans' are an emergent online Chinese phenomenon in which naked selfies of young women are used as collateral in underground peer-to-peer loan systems. These selfies depict the naked borrower holding her Chinese ID card - if she fails to repay, the loan the image is made public and sent to her family and friends. The practice of naked loans was suddenly made public in November 2016 when a 10G Zip-File containing naked images of 167 women was released and circulated on the Chinese internet. This paper traces the different becomings of naked loan images as they travel through the networks of the Chinese internet. It explores the socio-technical relations they form and the way they produce a particular version of the subject of debt. It argues that attention to multiplicity and technological affordance is necessary to understand this phenomenon: while the commodification of female bodies is an obvious element, there is much more to naked selfie loans than this mode of objectification. The paper is based on analysis of Chinese media sources and a walkthrough method of traversing the structures, filters, and pathways of relevant online spaces. Employing the empirical ontology of Annemarie Mol and John Law, the paper focuses on the way these images come into being and circulate as collateral, as pornography, and as illegal objects targeted by government regulation. While centred on naked loan practices, the paper also contributes to a rethinking of selfies as 'multiple', active, and persistent.
  The Politics of Urban Design: Google is Here to 'Fix' Toronto *Anna Artyushina, York University*

In October 2017, the Government of Canada and Alphabet, Google's parent company, announced that the city of Toronto was chosen as the site for a new project, a smart city powered by Google's technologies. Called Quayside, it won't be an actual city, but a new neighborhood in the city of Toronto. Conveniently located on the eastern waterfront across downtown Toronto, Quayside promises to offer private residents and office spaces run exclusively by AI and big data algorithms. While it is not the first urban design project to use technology, the Quayside project is special in one respect: being co-invested by the Province of Ontario, Canada, Quayside will be planned in accordance with residents' needs. In the official documentation recently submitted to the City of Toronto, Google's Alphabet promises to 'fix' some social and infrastructural problems of the city by offering residents of the new neighborhood previously-unknown technical means for work, communication, and recreation. Quayside has received mixed public response, with experts and citizens expressing concerns about Google taking up functions normally performed the government, possible technical breaches, and the infringement of individuals' privacy. Drawing on social theory and studies of urban design, I examine the social imaginaries invoked by Alphabet and its critics during negotiations in the policy corridors and in the media.

The Walk of the Pen: Cadastral Mapping and the Digital/Analogue Nexus *Gabriel Tusinski, Singapore University of Technology and Design*
Recent cadastral (land claims) mapping programs in Timor-Leste partake of a combination of analogue and digital data collection methods. In the process, material objects and images are converted into digital forms and back again. This paper deploys anthropological and material semiotic tools to explore how landscapes, material objects and situated and contingent embodied actions of land claimants are translated/transduced into data points in a state digital archive of land claims data via the use of digital pens and standardized orthophotographic renderings. I argue that the photorealistic "truthfulness" of orthophotos coupled with the peculiar affordances of digital pens –particularly their capacity to indexically and iconically imitate embodied actions of pointing to property markers and walking boundary lines– exert a proleptic evidential power that persuades claimants to recognize themselves in the bureaucratic abstractions of an emerging digital land claim archive.

Transclusions: Ted Nelson and the affordances of electronic networks. *Hallam Stevens, Nanyang Technological University*
The World Wide Web is now widely associated with the pursuit of our lives online. Since the Web has become such a ubiquitous part of day-to-day lives in the developed world, this technology has become "naturalized" to significant degree. In other words, the Web has come to seem so natural and familiar to us, that no realistic alternative mode of organizing our online lives can be readily imagined. My aim in this talk will be to challenge these "naturalizing" assumptions by examining the vision and work of Ted Nelson, the "inventor of hypertext." Nelson argues forcefully against the Web as the tool for organizing material online or otherwise: "The World Wide Web was precisely what we were trying to PREVENT. We long ago saw the problems of one-way links, links that break (no guaranteed long-term publishing), no way to publish comments, no version management, no rights management" (http://xanadu.com.au/ted/XU/XuPageKeio.html). Nelson's assertions are deliberately tendentious (as he says: "Somebody's Got to Disagree"). But they are useful for interrogating the relationship between the Web and the social structures that gave rise to and support it. Thinking about alternatives to the Web can shed light on the affordances of the Web itself. Nelson's work shows that hypertext originally belonged to non-digital systems and provokes us to think about whether what alternative possibilities might exist for designing our digital worlds.

Session Organizers:
Jenny L Davis, The Australian National University
Timothy Graham, Australian National University
Baptiste Brossard, The Australian National University
Chair:
Baptiste Brossard, The Australian National University

205. Science and Activism: Transdisciplinary Approaches
Papers for Open Panels/Science and Activism: Trans-Disciplinary STS Approaches
Open Panel
2:00 to 3:30 pm
ICC: C2.2
Participants:
Ecological authority by gaslight: A doubt manifesto. With hedgehogs. *Laura McLauchlan, UNSW*
In light of the domination of many earthly habitats by humans, making liveable space for other species often requires active provisioning. In the UK, with hedgehog populations in decline, instructions from ecologists are typically publicly expressed as straight-forward factors: the provision of appropriate habitat, food and water, checking for hazards and the connection of properties to allow hedgehog mobility. In practice, however, the work of urban hedgehog conservation is a necessarily uncertain task of extrapolating from ecological studies to the ever-emergent realities of life. The day-to-day work of making space for hedgehogs requires careful experimentation. As Annamarie Mol writes of the work of diabetes care: "Even idealised practice is not ideal. It is a matter of trying things out and of being willing to revisit what has been done before" (2008: 56). As hedgehog ecologists noted, decisions are made in climates of well-informed doubt. However, public expressions of what hedgehogs need frequently exorcised such subtleties. In this paper, I look at such doubt erasure as a commonplace form of gas-lighting, leading lay conservationists, who look to public authorities, to come to doubt their own experiences of the uncertainties of making space for hedgehogs. Using Isabelle Stenger's work on the authority-restricting effect of public expert 'guardians' (2015) and Sheila Jasanoff's "technologies of humility" (2007), I argue for the importance of public acknowledgement of working with doubt. Such doubt is vital not only to reflect the realities of life, but also to call for a broader sharing of environmental decision-making and action.

Ghosts in the Shell: an anthropological investigation on DIYbio and the Cyborg. *Gil Vicente Nagai Lourencao, State University of Campinas - UNICAMP; Marko Monteiro, State University of Campinas*

This paper seeks to bring the recent data from my postdoctoral research, which seeks to investigate the practices known as DIYbio or Do it yourself Biology. The theme is the theory, practice, and conceptions of science in relation to DIYbio, from where I have been developing an investigation about the problem that is placed in this practice that seems to raise the question about the place considered as necessary to realize 'science' and its applications in the human body. The acronym refers to laboratories, quasi-laboratories, and facilities without state financial resources and without effective funding links, assembled by independent researchers of the current funding networks. This movement began in mid-2000 in many places such as the US, Europe, Japan, Brazil and the main idea is that such researchers seek to create ways to use and share technologies within the concepts and practices already used by hackers and bio-hackers; for example, open-access information, cyber countermeasures, prostheses and robotic implants, use of synthetic substances, DNA analysis, among other actions. This research is being done through ethnographic fieldwork in laboratories and quasi-laboratories, university facilities, events, literature review and through the monitoring of DIY and DIYBio processes in Brazil and Japan. About the participation in this panel, my work can bring data and ways of thinking the intersections between science and activism, helping to reflect on the new perspectives on science, its epistemology, and its practices. Keywords - Anthropology, Body, Japanese Culture, Japan, Cyberculture, DIYbio, Science.

Using knitting to stay with the trouble *Tracy Anne Sorensen*

I have found that staying with the trouble as an activist in the climate change movement brings with it almost unendurable grief, conflict and stress. Is it actually possible to tolerate this stress and keep moving? I have been an active member of my local climate action group for over ten years. What has helped me to stay with the trouble, to use Donna Haraway's phrase, is craftivism: specifically, using crochet and knitting to explore issues relating to climate change and the more-than-human world. In this auto-ethnographic account, I discuss how knitting a representation of a grey headed flying fox helped me endure the stressful lead-up to a public "bat night" in Bathurst. The bat night was a response to the unprecedented establishment of a grey headed flying fox colony in the main town park in the summer of 2017/2018 and the Deputy Mayor's calls to get rid of it. With local animal welfare activists and ecologists deeply divided over a range of related issues, the success of the event was called into doubt. These controversies gave me sleepless nights and mental vows to quit climate activism and pursue and easier life. But focusing on completing a knitted bat, stitch by stitch, calmed me down. At the same time, the knitted bat was able to delight, defuse and unite where theoretical arguments could not. Yarn crafts, I argue, can quieten and refresh the noisy bodymind, allowing it to continue to engage with the giant issue of climate change.

Session Organizer:
Laura McLauchlan, UNSW
Chair:
Laura McLauchlan, UNSW

206. The continued relevance of ethnomethodological studies of science and mathematics for STS

Closed Panels
Traditional (Closed) Panel
2:00 to 3:30 pm
ICC: C2.3

Ethnomethodology is sometimes recognized in STS as having been important for the turn to practice that began in the 1970s. The reflexive examination of social science methods by ethnomethodologists provided a basis for studies day-to-day natural science practices, elementary and advanced mathematical work, and technology design and use. Although ethnomethodology has not quite become 'merely of historical interest' for STS, it also is not very much in evidence at the present time. It has been seamlessly, and often invisibly, incorporated into a commitment that runs through much of STS to treat science as 'construction all the way down'. The purpose of this panel is to demonstrate that, and how, ethnomethodology remains relevant to STS, not only as a precursor but also as an approach that continues to explore conceptual and empirical lacunae that tend to be neglected (as though already settled) in studies of the sciences and mathematics. As STS has expanded into ever-broader domains of scientific, medical, and other activity, the so-called 'hard' cases of physical science and mathematics are less often addressed in substantive practical detail. The studies in this panel come to terms with what is 'hard' (in the sense of being both practically challenging and difficult to translate into common idioms) about natural scientific and mathematical practices. Such studies are especially pertinent at a time when expertise is being demeaned and scientific advice has become all-too-easily dismissed in public life.

Participants:

The Disappearance of "Discovery" as a Topic in Science and Technology Studies: An attempt at retrieval and ethnomethodological respecification *Jeff Coulter, Boston University; Michael Lynch, Cornell Univ.*

by Jeff Coulter and Michael Lynch The concept of discovery continues to be of interest in philosophy of science, but has largely disappeared as a prominent topic in STS. With the rise of social constructivism in the 1980s, individualistic and heroic narratives of discovery were deemed incompatible with the emphasis on collective agency in and around science. The concept of discovery may also have seemed part of the realist legacy, with the assumption that natural entities await their discovery in a world independent of human intervention. In addition, the sciences themselves (especially the biomedical sciences which preoccupy so much current STS research) recently have emphasized the manufactured (and thus patentable) properties of novel research objects, in contrast to the notion that such objects pre-exist human intervention. This paper takes up the topic of discovery as a social phenomenon, while seeking to avoid any reversion to naïve realism or psychologistic individualism. Augustine Brannigan's constructivist treatment of discovery provides a starting point for respecifying "discovery" as a vernacular concept that is used to claim and contest particular research products. Viewed in this way the status of a discovery is adjudicated in terms of conceptual grammars, and such grammars are subject to investigation. One particular area in which such grammars are investigable is patent law, particularly in terms of a distinction between "compositions of matter" (which are eligible for patents) and "products of nature" (which are not). This paper provides a grammatical treatment of "discovery" in several perspicuous cases.

"How did that feel": Managing and monitoring pain in cognitive neuroscience experiments *David Matthew Edmonds, The Chinese University of Hong Kong; David Matthew Edmonds, The Chinese University of Hong Kong*

Laboratory studies in STS have traditionally focused on the hard sciences; physics, biology and the like. In contrast, experimental psychology has been relatively neglected. The present research continues the rich tradition of ethnomethodological lab studies (e.g. Lynch, 1985; Sormani, 2014) and examines cognitive neuroscience experiments using electroencephalogram (EEG) and transcranial magnetic stimulation (TMS) technologies as objects of study in their own right. The study draws on ethnographic observations and approximately 42 hours of video recordings of experiments from three laboratories in Asia and Australasia as data. A key topic that emerged from the data is how a concern for managing any pain or discomfort subjects may experience is a practically relevant matter that pervades most aspects of experiments in this field (e.g. their planning, design and undertaking). This study offers an ethnomethodological respecification of "pain". Instead of viewing it as an internal physio-psychological state, the study focuses on how pain and discomfort figure as practical concerns in psychologists' situated work. The study presents two main findings. First, I focus on the training of novice experimenters in the correct techniques to lessen the chances of subjects' discomfort. In particular, the role of embodied demonstration, correction and "checking on" participants is emphasized. Second, I document the different ways that pain is dealt with in situ in experiments proper.

The Banality of the Social in the Work of the Sciences *Eric Livingston, University of New England, Sociology - Criminology*

Understanding the intrinsically social character of scientific findings remains a recalcitrant problem in the study of scientific practice: how, for example, does a statement such as 'the sum of any finite number of even numbers is an even number' or the claim that water, in some sense, consists of H2O molecules reflect the social circumstances of its discovery? By first considering routine activities of everyday life, this talk suggests that the interactional substance of such findings lies in the observable, technical details of practitioners' work.

Session Organizer:
Michael Lynch, Cornell Univ.

207. Indigenous Knowledges and Technologies 3

Papers for Open Panels/Indigenous Knowledges and Technologies
Open Panel
2:00 to 3:30 pm
ICC: C2.4

Indigenous knowledges and technologies, i.e. knowledge and artefacts produced by native people from around the world, such as Amerindians, Aboriginal Australians, and so on, are a marginal topic in STS. Few studies, articles, and books have been published on the topic in spite of the array of experiences and approaches from other fields such as media studies, anthropology, telecommunications, human rights, to mention a few. About the late 1980s and early 1990s there was a turn in STS towards the science-policy interface, which resulted in local knowledges and expertises becoming an emerging topic in the area. Nowadays, citizen and open science are popular research topics and receive growing attention from STS scholars. However, indigenous knowledges and technologies remain a marginal topic in the field. STS appears to still be in need of a process of decolonisation as to a large extent it is still insensible to knowledges, technologies, practices and epistemologies that have arisen from indigenous people around the globe. This panel seeks to bring together researchers interested in a range of topics related to indigenous knowledges and technologies, including, but not restricted to: a) the appropriation of Indigenous knowledges and technologies; b) Indigenous knowledges and technological policymaking; c) Uses and developments of information and communication technologies (ICT) by indigenous peoples; d) Decolonial and Postcolonial indigenous STS; e) Clashing ontologies between indigenous and modern societies; f) indigenous knowledges and sustainable community development

Participants:

Indigenous epistemologies in global health: WHO regulation of traditional medicine since Alma Ata 1978 *FRANCESCO SALVINI, Kent Law School, University of Kent; Emilie Cloatre, Kent Law School, University of Kent*

The paper examines the history of the WHO's engagement with traditional medicine, as a way to interrogate the regulatory shaping of indigenous epistemologies in global health. It argues that this history offers important insights in understanding both how alternative epistemologies of care have been mobilised or side-lined in global health over the last 40 years, and the influence of neoliberal ideologies on the politics of healing. The paper critically reads the key WHO documents, practices and institutions that have engaged with traditional healing, since the discussions leading to the 1978 Alma Ata declaration. In turn, it argues that an effect of these discourses and regulatory strategies is to erase the alterity of indigenous knowledges through an acceptance that is conditional on their subordination. An effect is the effacement of the political boldness of indigenous alternatives. Such process is part of a longer history of appropriation, exclusion, transformation and conditioning that has surrounded indigenous knowledges since the colonial era. In those movements, notions of tradition and modernity have come to categorise what epistemological arrangements could be considered as legitimate participants in contemporary healthcare. The paper engages with these issues by resignifying the traditional, as a practice that stands before (not only as "previous to", but also as "in front of") modernity, allowing us to replace traditional epistemologies of healing and caring as a matter of the contemporary. In doing so, the paper exposes the tensions between appropriation and regulation surrounding indigenous epistemologies, contributing to the decolonisation of global governance of healthcare.

Mediating Indigenous Knowledges: Communicative Practices in Defense of Life and Territory *Claudia Magallanes-Blanco, UNIVERSIDAD IBEROAMERICANA PUEBLA*

This paper explores the ways in which communicative practices displayed by indigenous peoples in the ongoing struggle to defend their land, life and territory can be understood as part of Indigenous Knowledge (IK). Indigenous mediated practices such as video or audio production are tools that convey Indigenous knowledges inside the communities, across other indigenous communities and to the general population. They are also forms of technological appropriation (Ginsburg) by

indigenous peoples using non-indigenous technologies in ways that are coherent with their epistemology (Schiwy). Based on empirical data obtained for the past three years using participatory methodologies, the paper analyses how some indigenous communities in Mexico have displayed an array of communicative practices rooted in their multiple ways of knowing enhanced by the amplifying ability of media technologies to reach large audiences simultaneously. These communicative (and mediated) practices are being used as ways to defend land and territory against the menaces of extractivist and "developing" projects that overall pose a grave threat against indigenous lives.

The many lives of Mandan maize: the appropriation, circulation, and cultivation of Native American corn varieties in the United States and beyond *Helen Anne Curry*

At the turn of the twentieth century, US corn breeders began in earnest to produce varieties that would be uniform and predictable as well as higher yielding. This pursuit ultimately culminated in the near-complete dominance of hybrid varieties of Corn Belt Dent across the the United States, along with the abandonment of many older, open-pollinated corn varieties. Even from the outset of this transition, some corn growers and breeders saw value in the varieties being displaced, and sought to collect and preserve them. These included especially varieties cultivated by Native American farmers. In this paper, I explore the history of so-called Mandan maize, open-pollinated varieties of corn originating among Native American farmers (Arikara, Hidatsa, and Mandan) of the Northwest United States. I trace the journeys of Mandan maize from the hands and fields of its originators to nineteenth-century seed markets, from early twentieth-century ethnographical salvage missions to the first modern gene banks, ending with a reflection on its present prized status among seed savers who reject the modern industrial agricultural system. This exploration of the many appropriations and re-appropriations of indigenous knowledge and technology (that is, corn seeds) reveals the consistent, if sometimes competing and contested, valuations of these across more than a century of US corn cultivation.

Totemism and Indigenous Science *Stephen Muecke, University of Adelaide*

This paper revisits the anthropological category of totemism under the aegis of multi-species ontologies. When asked a fundamental question, 'on what basis do human and non-human life coexist?', the 'Western' naturalist solution is to put humans in cultures and non-humans in Nature. The solution in so-called totemic societies, that refuse the singular concept of Nature, is an extraordinary invention: totemism as an expert Indigenous scientific construction pertaining to the crucial importance of the continuity of 'nature' and culture'. While the 'Western' system has radically divided nature from culture, the better to exploit the former, Indigenous 'sciences', may have invented totemism and kinship laws to make responsibility for non-humans explicit. Examples are given from traditional Australian Aboriginal totemic systems, as well as contemporary activist politics.

Theorising Partiality & Plurality in Science *Mythily Meher, University of Melbourne*

Science has no nation, but nations have science, and a nation's science(s) are plural and mobile. My paper concerns the ways that orders of scientific knowledge are re-ordered, even re-hierarchised, when different forms of pluralism meet. The fieldwork I draw on attended to what medical pluralism looks like when people from sub-Saharan nations, with histories of a range of healing traditions—amongst them psychiatry, cosmopolitan medicine, faith healing, and spiritual cleansing—move to Australia, which is comprised of nations with their own colonial legacies of reordered of knowledge. What can emerge in these conversations, in clinics and communities, is people's willingness to ultimately discern what they know from what they do not know and what they cannot know. The sense of science and knowledge as necessitating at least some uncertainty resonates with other situations where orders of knowledge meaningfully meet, like the preclinical trials of an indigenous Xhosa medicine in South Africa, which saw izangoma (diviner-healers) working with molecular biologists in the lab (Laplante 2014). In this paper, I seek to fill out the partiality of such sciences – not by 'filling the gaps', but by addressing them theoretically, thinking with lineages of philosophising particular to times and places better suited to grappling with such plurality.

Session Organizer:
Tiago Ribeiro Duarte, University of Brasília

Chair:
Carlos Francisco Baca Feldman, Redes por la Diversidad, Equidad y Sustentabilidad A.C.

208. Travelling Knowledge (III): Networks of Scholars and Objects
Papers for Open Panels/Travelling knowledge: theories, methods and empirical research made in circulation
Open Panel
2:00 to 3:30 pm
ICC: C2.6

Despite opposite forces recently observed, globalization still seems to be a driving force for much of current trends in science and technology. The increase of internationalization of scientific and technological practices, from faculty/student mobility to co-authorship of articles, is an indicator of a process that still needs further understanding. In this panel, we want to explore in depth how the circulation of knowledge between different spaces of production transform such knowledge, the actors involved, the procedures through which it travels and the means of diffusing the outcome of research. In particular, we want to illustrate how asymmetries between groups, institutions, and countries play a crucial role in shaping the circulation of knowledge. In this sense, this panel authors present historic, empirical and theoretical analyses on the circulation of knowledge by studying the movement of people and objects throughout history.

Participants:

Knowledge Accretion and Dispersion of Agricultural Bioinformatics products within Aboriginal Groups in Jharkhand (India) *diwakar kumar, central university of gujarat*

The research contemplates how informal communication among aboriginal groups and technologies like Information and Communication Technology (ICT) affects knowledge dissemination behaviors in the agricultural practices especially in left out rural spaces in Jharkhand (India). Knowledge grasps a key position in the present strategic management theory. It is recognized as valuable intangible resource that has the capacity to hold

competitive advantage for the generation of long-term boons. In the last few decades the emergence of biotic and abiotic stress due to rapid change in climatic conditions and the consumption pattern of natural resources have brought technological change to impose radical change in the agricultural practices and application of agricultural bioinformatics products. ICT has explored the more recent approaches to deal with farmers and has restructured the approaches to sustain in the competitive world. The objective addresses through qualitative methodology that covers in-depth interviews and focused group discussions. It is very interesting to note that technological factors are deeply rooted within the culture of working environment. Knowledge as an asset needs to be protected and creates an environment where knowledge can be accumulated and shared. Thus the use of ICT allows diffusion of innovative agricultural practices that allows more efficient production in field. The major outcome of the research is that management, policy and regulatory mechanisms should put furthermore significance on knowledge dissemination strategies in such left out rural spaces for achieving forthcoming targets in long-term success.

Knowledge through the media and the perception of public policy effectiveness *Andre Sica de Campos, Unicamp; Janaina Costa, Unicamp*

In 2015 an outbreak of microcephaly was identified in Recife City (in the Brazilian Northeast). Eventually, Brazilian scientists established the relation between such cases and the occurrence of Zika virus. Pregnant women in Recife were infected with Zika virus prior to the outbreak. Similar cases occurred elsewhere in Brazil and in Colombia subsequently. At the time, the general public, scientists and health professionals demanded further access to information to a topic where there was limited established scientific knowledge. Considering the uncertainty involved, and how quickly Zika and microcephaly became major topics in the national and international media, the aim of this article is to elucidate how the effectiveness of public policy with regard to the Zika crisis was understood by the public in Brazil. The research methodology employed a semi-structured questionnaire and the sample covered 103 face-to-face interviews, including health professionals, scientists, and the general population - including those directly exposed to the outbreak. We enquired how the interviewees were informed about and perceived this crisis. The main findings suggest that public perception of the effectiveness of public policy is related to the volume and content of information about the virus. Information circulated more intensely during the crisis, therefore interviewees acknowledged higher effectiveness during this time, once the circulation of information decreased the public perceived that the Zika crisis as either resolved or neglected by the government. Previous studies on the Zika crisis focused on the volume of media attention, this study contributes by complementing the literature with the perception of the public to the media.

Politics, Ideology, and Hegemony in 'Truly International' Mathematics *Michael Barany, Dartmouth College*

In theory, just about anyone can be a mathematician. Theorems and proofs, for the most part, don't discriminate based on race, class, gender, disability, national origin, or anything else, at least in principle. Historically, the field

and profession has been open to very few. Mathematicians have grappled in many different ways with this gap between an ideal of openness and and a reality of exclusion and even outright discrimination. I will show how American mathematicians took leadership of the international mathematics community over the period between 1920, when they first proposed to host an International Congress of Mathematicians, and 1950, when they finally brought one to fruition. American mathematicians tried to reshape mathematics as a more interconnected and inclusive discipline, succeeding in some ways and failing in others. In particular, they tried to create what they called a "truly international" discipline, and I will explain how this ambiguous and shifting phrase helped them navigate a wide range of political, financial, and other obstacles, while covering over persistent problems and blindspots. American mathematicians' pliable "truly international" rhetoric underwrote a revisionist history of their discipline, let them stake claims in new postwar political and infrastructural circumstances, and proved a forceful device to combat the hegemonic interests of other national mathematical societies.

Technical appropriation and global circulation of instruments at the National Astronomical Observatory of Chile (1886-1887) *Sanhueza Carlos, Universidad de Chile; Lorena B. Valderrama, Universidad Alberto Hurtado*

This paper analyzes the debates regarding the maintenance, repair and acquisition of astronomical instruments as a way to better understand the phenomenon of technical appropriation in a peripheral country. The disagreement between José Vergara, director of the National Astronomical Observatory of Chile (NAO), and the second Astronomer of the same institution, Adolf Marcuse, between 1886 and 1887, involved the state and maintenance of an Equatorial, a Meridian Circle and a Comet Seeker. This presentation follows the approach that Simon Schaffer proposed in 2011 to discuss the notion of technology transfer in a global network. Thus, it studies how the use of objects requires not only their maintenance but also their transformation. The controversy offers us the possibility of considering two aspects of this process: first, how worn, rusted and damaged instruments were repaired, which allows us to observe the role of local technicians and workers. Second, how the instruments were adapted to conditions of observation and operation different from those of the northern hemisphere.

Transcendental networks: scholars, objects and internationalization *Leandro Rodriguez Medina, Universidad de las Americas Puebla*

The study of the internationalization of science seems to be exclusively focused on the natural and formal sciences and on networks of the Global North. A shift towards the social sciences and a peripheral region (Mexico) is proposed here and shows that two different types of networks are enacted to face the challenges of internationalized research. On the one hand, there are strategic networks which internalize the pressing structure of incentives and tend to reproduce an over-professionalized idea of the academia. On the other, there are networks that try to strengthen international bonds according to certain politico-ethical imperatives and which I call transcendental networks. In this article,

relying on current research on internationalization of the Mexican social sciences and the short history of the recently launched journal "Tapuya: Latin American Science, Technology and Society", I explore transcendental networks and discuss their implications.

Session Organizer:
Leandro Rodriguez Medina, Universidad de las Americas Puebla

Chair:
Leandro Rodriguez Medina, Universidad de las Americas Puebla

209. STS Across Borders: Recap and Next Steps

Single Paper Submission
Special Event
2:00 to 3:30 pm
ICC: E3.10

STS Across Borders has been designed to stimulate interaction across different regional and intellectual formations of STS, and generate infrastructures -- of collection, collaboration, circulation, and review -- that can enable and support those interactions. It has had many experimental dimensions -- in the way it draws STS researchers into collaborative, comparative work, in the way it is archiving and curating the history of the field, and in the way it asks exhibitors to characterize distinctive modes of STS while also drawing out diversity within any particular STS formation. We have also been experimenting with a new form of review -- that we've called an "elaborative review" -- that asks reviewers to suggest what could be added to or elaborated in a collection to better convey the history, context, and dynamics of the particular STS formation under consideration. This session is intended as an open discussion space to reflect on what we have collectively learned from the STS Across Borders experiment at 4S Sydney and anticipate next steps.

Session Organizer:
Aalok Khandekar, Indian Institute of Technology Hyderabad

210. Producing Transformations: Drugs, Bodies, and Experimentation 3

Papers for Open Panels/Producing Transformations: Drugs, bodies, and experimentation
Open Panel
2:00 to 3:30 pm
ICC: E3.2

Throughout history, drugs and medications have been used to produce transformations. Experiments with different substances have taken place in diverse contexts: individual, subcultural, communal, scientific, medical, commercial, criminal/illicit and transnational. Despite the immense diversity and heterogeneity of these experiments, each is subject to specific norms, protocols, evaluative criteria, and concerns; and each often entails assembling publics to validate their findings or assess whatever emerges from them. This Open Panel invites papers about the transformations (intended or otherwise) associated with different practices of drug experimentation and consumption. Against commonplace understandings of drugs as stable entities with unique chemical properties that act to produce identifiable effects, the ontological turn in STS inspires a growing number of drug researchers to conceive the action of drugs and their purported effects to be produced in relation to various other actors, arrangements and networks. How do the practical arrangements devised to put drugs to the test in different places and times tally with the historical, cultural, technological and material processes in which drugs are implicated, and which undoubtedly mediate, extend, and complicate their effects? How are those transformations that

extend beyond the experimental apparatus accounted for? What gets neglected? What criteria render specific experiments legitimate, and others illicit, and how are these criteria contested, changed, and/or adapted over time? What is unique about the adventures such experimental subjects undertake? What matters to them? What can be learned from situating their activities? How are their findings translated to other situations, and with what implications?

Participants:

"Do those results from elsewhere apply?": How American regulators question the validity of clinical trials conducted "elsewhere". *Loes Knaapen, Université d'Ottawa*

STS scholars have highlighted how clinical trials employ strict protocols to produce "decontextualized" data and claim "universal" results. They have critically examined the transformations taking place "when experiments travel" to low resource settings, whether in Eastern Europe or the Global South. We extend this research, by investigating what happens when data produced in multi-sited clinical trials travels "back" to the Global North. This paper is part of a larger project that examines what counts as knowledge in the e/valuation of new drugs at the Food & Drug Administration (FDA) in the USA. It relies on qualitative content analysis of verbatim transcripts of Oncology Drug Advisory Committee (ODAC) meetings. We examine how ODAC experts question the validity of data from clinical trials conducted outside North-America (mostly in Eastern Europe). We show that some trials are rejected as unethical, or the quality of laboratory data is distrusted. However, discussions whether non-American trial subjects are "comparable" to American patients focuses mostly on whether 'local' or 'American' standards of care are incorporated into the trial. We will argue these debates can be interpreted as ODAC members questioning whether trials measure the drug to be tested, or the « local biologies » of trial subjects. Moreover, the debates over the comparability of trial subjects and American patients reveals that trial data must not only answer 'which drug is best for patients?', but also answer 'who are the best patients for this drug?'.

Understanding bacteria as always pathogens fuels overprescribing of antibiotics for urinary tract infections in hospitals: Clinicians' and older adult patients' experiences *Paula Saukko, Loughborough University; Emily Rousham, Loughborough University; Beryl Oppenheim, University Hospitals Birmingham NHS Foundation Trust*

Older adults often have asymptomatic bacteriuria or bacteria in their urine without symptoms of a urinary tract infection (UTI), which guidelines recommend not to treat with antibiotics. Drawing on science and technology studies we argue that a Pasteurian understanding of bacteria as always pathogens makes it difficult for clinicians not to treat bacteria in urine and fuels antimicrobial resistance (AMR). Our argument is based on interviews with doctors, nurses and older adult patients (n=41) in three UK hospitals in 2016-17. Following Arthur Frank's work on illness narratives we identified three ways of understanding, acting on and speaking about UTIs and bacteria. First, some clinicians, particularly nurses, and patients saw UTI diagnosis as a straightforward process of spotting signs of infection, treating it and restoring the patient's health. Second, other clinicians, particularly doctors, experienced UTI

diagnosis as a chaotic process, leading to overprescribing and shot through with ambiguities about symptoms, urinary dipstick and laboratory results and recovery. Older adult patients were often bewildered by repeated UTI diagnoses and courses of antibiotics. Third, we identified some alternative, post-Pasteurian ways of understanding bacteria as a natural part of older patients' biology, as being harmful in specific clinical situations and as clearing with waiting and hydrating. We conclude with discussing how understandings of bacteria intersect with the professional cultures of nurses and doctors and lay understandings, creating both obstacles and possibilities for reducing overprescribing.

Transforming Altruism Into Solidarity? The Case Of Experimental Subjects In Psoriasis Research In Germany *Laura Schnieder, Goethe-Universität*

That experimental subjects and tissue donors in biocapitalism act out of a thoroughly altruistic motivation, out of mere selflessness, has been, and still is, a powerful narrative that is constantly revived by various actors involved in biomedical research. STS approaches are challenging this notion, pointing to its conceptual shortcomings and/or critiquing its social consequences, e.g. the creation and securing of access to a massive unpaid labour force for biomedical innovation. In a conceptual, governance-oriented line of critique, Barbara Prainsack and Alena Buyx (2016) advocate for solidarity as a tool for analysis and a normative point of reference in biomedical practice today. The paper takes up findings from a case study involving experimental subjects and medical personnel in psoriasis research in Germany and discusses the following questions: Do altruistic motives matter in experimental subjects' accounts? Would these matters more accurately be described by introducing the concept of solidarity? And if so: Solidarity with whom? Which pitfalls and critical potentials do or do not unfold within the process of such a reinterpretation? And how is the figure of the experimental subject herself transformed?

From Visible to Invisible: Molecularization of Practice in Histopathological Diagnosis of Lung Cancer *Yeh-Han Wang, Institute of Science, Technology, and Society, National Yang-Ming University*

Many targeted drugs treating lung cancer are available on the market in the recent decade, and their effectiveness for selected patients has been well-established in clinical trials and current treatment guidelines. Whether or which gene mutated plays a critical role in the management of certain patient groups. Therefore, the guidelines have recommended more different genetic tests during the process of diagnosing lung cancers, which in the meanwhile transformed pathologist's practice on tissue diagnosis from their traditional gold standards of morphology to the invisible genetic molecules. According to document analysis and participant observation, I noticed a process of molecularization on thinking and practical process during the diagnosis work. Compared with the distinction between small cell and non-small cell lung cancer in the past, pathologists now make more efforts to diagnose adenocarcinoma from other subtypes in the first small biopsy with the aid of immunohistochemical stains. At the same time, owing to limited tissue amounts from the single biopsy and more and more recommended genetic tests, pathologists also

cut the numbers of the stains they use, saving more cancer cells for further molecular testing. The molecularization of diagnosing practices doesn't only demonstrate changes in classification work by pathologists in the era of precision medication but also inevitably reforms the biomedical platform of diagnosis and treatment under the politicoeconomic framework of the current health system.

Transforming Pharmaceutical Capacities: Experimenting with Antibiotics in Food and Beer Production in Tanzania *Laura Meek, University of California, Davis*

Powerful antibiotics are readily available for purchase throughout Tanzania, and Western policy makers regularly decry this situation as dangerous and disordered, as if no rules govern the use of antibiotics in Africa. While Western biomedicine perceives pharmaceuticals as cures for disease, in Tanzania such medicines are understood to be volatile and potentially dangerous substances- one among many unpredictable, fluctuating, and highly contemporary forces from outside, whose potentials are at once positive and negative. In the prevailing Western understanding of antibiotic use in Africa, 'truth' lies in the science that goes into the making and proper prescription of drugs, and such deviations as 'overuse' result from the fact that locals misunderstand what these drugs are and how they should be used. In this paper, based on over two years of ethnographic fieldwork, I argue that Tanzanian practices are aimed at determining the 'true' nature of these drugs, at differentiating types of drugs, and at establishing control over their variable capacities. I explore this process through two examples: the popular discourse critiquing the role of antibiotics in the husbandry of 'modern' chickens, and the role of bitter antibiotics as a flavor and potency-enhancer in locally brewed beer. These examples demonstrate how Tanzanians both resist and remake the capacities and potentialities of antibiotics, while also emphasizing the role that embodied epistemological practices play in the production of knowledge.

Session Organizers:
Kane Race, University of Sydney
Kiran Pienaar, Monash University
Dean Anthony Murphy, University of Sydney
Chair:
Dean Anthony Murphy, University of Sydney

211. Critical Data Studies: Ethics and Human Contexts of Data Science III
Papers for Open Panels/Critical Data Studies: Human Contexts and Ethics
Open Panel
2:00 to 3:30 pm
ICC: E3.3
This is the third in a series of three panels addressing a range of questions on the ethics and human contexts of data science. This panel focuses on the ethical impacts of data science applications from case studies to the development of theoretical frameworks.
Participants:

Towards a Normative Ethics of Online Moderation *Andrew Arthur Fitzgerald, Stanford University; Anna Gibson*
The tension between inclusion and exclusion is an essential aporia of democracy. Liberal democracy values inclusion and diversity, but it tempers this with a condition of mutual respect (Gutmann and Thomspon, 1996). More-radical or critical approaches push inclusion

further (Young, 2000), or reject the constraint of mutual respect entirely (Fish, 1999). These ethico-political questions also apply to digital publics and online content moderation, particularly automated moderation. This paper aims to outline the key ethical questions both practitioners and scholars should consider in designing moderation policies and systems. Some questions include: what categories of online behavior should be used to determine whether an individual should be sanctioned or banned from a group? Metadata? If so, what kinds? Associations or behavior in other groups? Additionally, what weight should we give to what actions – aggressive speech, harassment, hate speech, sexist/racist/ableist language? Can any users be banned or silenced a priori: e.g. for affiliation with hate groups? Should bots have the same rights/responsibilities as human users? How long should a ban or mark for abusive behavior stay with a user – can their be hope for rehabilitation or "paying one's dues"? What about users that use obfuscation to mask behavior and identity in community, and across platforms? What should the balance be between automated and human moderation? Should there be "due process"? Engagement with these questions, we hope, will move us towards a normative ethical framework for online moderation, and also contribute to contemporary theory about digital democracy more broadly.

Vietnam Rural Broadband Internet Roll-Out: Rural Resident Voices Versus Mainstream Depictions *Trang Pham, University of Calgary, Department of Communication, Media and Film*

In developing countries, Information and Communication Technology failures pose a significant problem that can be attributed to a top-down approach that excludes technology users in the shaping and usage of technology in global south. This is particularly the case in Vietnam where the state recently approved a national information and communication plan in 2011. The plan included the building of a $400 million broadband network infrastructure intended to link all smallest administrative units in rural Vietnam by 2015.The country did not meet this goal and extended the deadline to 2020. Theories of social construction of technology have strongly developed and influenced science and technology studies; however, only a limited number of studies adopted the theories in non-western contexts. This paper will extend theories about relationships and interactions between technology and society to make them more applicable for a developing world. The paper also draws on critical constructivism to highlight lay users' stances and contributions in forming a technology that responds to their spectrum of needs. The methodology is two-fold: qualitative content analysis of newspapers over the past 10 years and relevant government policy documents about broadband internet in the country; and interviews and focus groups with 79 rural residents in six provinces. Preliminary results showed mainstream documents depicted this group of users as "know-nots" who possess urgent needs of desktop computers, access, and training to use internet to contribute to the country's modernization and economic growth. Meanwhile, none of the interviewees had heard of the government's multimillion dollar plan, and few understood what broadband meant, though they were using the internet frequently. The paper argues that villagers' creative appropriation helped make broadband internet respond better to the users' local needs and choices and actualize their expansive realization.

Machine Learning and Re-consent: The Tech Ethics of Transcription Services and Digital Labs *Amanda Windle, London College of Communiciation, University of the Arts, London*

This paper focuses on the ethics of re-consent and data processing in relation to Artificial Intelligence, particularly machine learning. Academics put ethics into practice each time they rely on transcription services and today this bridges the human and nonhuman bringing together the research done in university and industrial research and development (R&D). By focusing on a software transcription service as a case study, I will elucidate on the ethical impacts of consent and data processing on a transnational service concerning EU and UK legal regulations. From group-consent through to the individual purchase of a transcription software package, several digital issues are raised, like the complexity of third party services and the current use of digital "tags" or "persistent cookies" and "web beacons" in conversational speech recognition. What unfolds is an account of participant consent and several digital schisms resulting in non-consent. These schisms are tied to the spatial setting of a group discussion at the Royal Society of the Arts London linked to a particular soundscape (captured in an audio recording). This paper evidences how consent is always, to an extent, a matter of continual re-consent. It is necessary to rethink ethics theoretically, through feminist ideas that combine ethics of ambiguity, atmosphere and situations when investigating the incompleteness of speech (Lave and Wenger, 1992; Star, 1994; Stengers, 1997; Sloterdijk, 2016, Suchman, 1987, and Wakeford, 2016).

Big Data, Big World: Knowledge Development in a Time of Transition *Hamish Robertson, University of Technology Sydney; Joanne Travaglia, University of Technology Sydney; Nick Nicholas, University of Technology Sydney*

The ethics of big data and especially algorithm use are now an established part of discourse in social science and technology studies environments. The transition from an analogue era of quantification in the social sciences and social policy domains, to a fully digital one is producing new problems and extending the scope of knowledge in the applied social sciences. One of the key problems here is the continuing dominance of the small data paradigm and the politics of population that it helped produce and regulate. Many social scientists have deep epistemic commitments to the small data paradigm and struggle to reconcile emerging methods with the ideological positions established under small data approaches. In this paper we discuss and explore how this shift in quantification and its associated technologies is effecting the field of applied social science, including social policy practices. Drawing on STS and geographic theory, we examine some of the spatial and epistemic contradictions resulting from this period of transition. We refer explicitly to the politics of counting and the role that quantification, as an epistemic technology, has played in social policy practices over the past two centuries. Digitisation runs the risk of encouraging a false objectivity in an increasingly globalised and digitised social policy environment. We conclude by discussing how the rise of digital technologies and methods are potentially destabilising the

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established small data paradigm and the risks of and opportunities for big data moving forward.

From Analog to Digital: Numbers that Ignite Cyberactivism *Mei-chun Lee, Department of Anthropology, UC Davis*

Numbers are seen as objective, self-evident, and static representations of the world we are living. Endowed with the power of representing the "fact" in this age of information, numbers become the foci of political debates and competitions. Politicians use numbers as weapons to defeat rivalries. Activists refer to numbers to challenge governments. All these strengthen the power of numbers. This paper examines an online hacktivist campaign in Taiwan, "Open Political Donations", by tracing the social life of a special set of numbers—the numbers of donations to politicians and political parties—through the venture from its analog appearance to a digital one. The numbers travel across spaces and mediums, from being held as documents in the government office, to photocopies with watermark,.pdf files in the computer, pieces of pictures on the campaign website, digits in the database, and visualized graphs on news platforms. The numbers are in continuously transformation. They are kept, freed, torn apart, recaptured, reassembled, and translated—until they are reborn as "open data" (a type of data that is freely available online and can be read by computers), which claims to bring "transparency" to democracy. Following the footsteps of this particular set of numbers, this paper examines the discourse of numbers and reveals how they tell stories, carry value, excite emotion, and trigger actions. Numbers urge us to see and believe, judge and act. They make politics.

Session Organizer:
Laura Noren, Obsidian Security

212. Cultures of Fact Travel

Papers for Open Panels/Cultures of fact travel
Open Panel
2:00 to 3:30 pm
ICC: E3.4

This panel invites research that addresses how facts and knowledge claims are represented, how they are evaluated and verified, the ways in which they face opposition or reach consensus, and/or how they travel through knowledge infrastructures. A large variety of sites and practices have emerged to host and distribute facts in digital environments. New facts are now born digital in the form of databases, data visualisations, online dictionaries and encyclopaedic entries but facts that existed before the Internet were always subject to structural, social and political forces. In order for a fact to travel, it needs to move from beyond its origins in the lab, the institution, company, field, or community to new audiences. Sometimes this translation happens between institutions, sometimes it happens between fields, or between countries, continents or languages. This panel will host different approaches to the production, evaluation, and distribution of facts in the past, present and future.

Participants:

How Wikipedia Works With Facts *Bunty Avieson, University of Sydney; Chao Sun, University of Sydney*

Wikipedia is a fact-processing factory. Its workers take existing knowledge, in all its variety and complexity, and collaboratively wrestle the facts into a singular all-encompassing narrative. The online encyclopedia places high value on transparency and its platform records the evolution of each page, including individual edits and editors' discussions. This provides an inside view on how the narratives come into being, that is, how Wikipedia collaboratively constructs knowledge. Taking the 2014 Sydney hostage crisis as a case study, this paper investigates the editors and processes that select and frame the facts to construct a singular narrative. Using quantitative and qualitative analysis, they look at the work performed by the 176 editors from around the world, who synthesized news reports as they were being published across a variety of international online platforms. The ad hoc nature of the encyclopedia that 'anyone can edit' produced a range of consequences including inaccurate information (South African media erroneously reported gunshots within the first few hours), facts that were marginally relevant (a Canadian editor fought to include a tweet of support from the Canadian Prime Minister) and hyperlocal information (an Australian editor included local road closures). But as our research shows, such inclusions didn't last long as more experienced editors brought order in line with Wikipedia's own policies. This paper demonstrates that in the world of Wikipedia facts are chosen and knowledge is constructed via a hierarchy of editors who bring diverse international perspectives, and who themselves function within the biases of their own internet histories.

Baidu in Thailand: Have Facts, Will Travel? *Sarah Logan Logan, University of New South Wales*

Chinese censorship practices ensure that facts are erased, created and modified anew, and tech companies operating in China deliver these facts endlessly as part of the conditions of their operation behind the Great Firewall. But Chinese tech giants are expanding abroad, concerning analysts and activists worried that these companies will impose on audiences outside China the shaping of facts they impose on users inside China, given their symbiotic relationship with the Chinese state. This paper examines the recent expansion of one of these tech giants, Baidu, into Thailand. It asks: does Baidu, the world's second-largest search engine, implement the information controls of the Chinese state concerning facts about contentious events, organisations and individuals for users searching in Chinese from Thailand? The paper tests search results from Baidu's product in Thailand for users searching in Chinese from Thailand. It tests search results for two sets of ten terms. The first is a set of terms sensitive in China, and the second is a set of neutral terms. The paper finds that, contrary to expectations, Baidu does not implement the information controls in Thailand which it does at home. In this instance, Chinese facts don't travel, with implications for how we understand the relationship between the Chinese state and Chinese tech companies, the expansion of Chinese tech companies abroad, and the nature of 'facts with Chinese characteristics' in the online space beyond the Great Firewall.

Audience Understandings of Climate Change News - Emotion, Scepticism, and Uncertainty *Andreas R.T. Schuck, Amsterdam School of Communication Research, Communication Science, Faculty of Social and Behavioural; Catriona Bonfiglioli, University of Technology Sydney*

This paper aims to analyse climate scepticism and emotional responses in news media audiences exposed to climate change news. The news is full of hotly contested debates over climate change. The public is the piggy in the middle between scientists striving to make the

complex science clear and vested interests' sustained campaigns to perpetuate confusion to stave off mitigation. This paper uses qualitative methods to analyse survey responses to a news article about climate change adjusted to include/exclude emotion and have three levels of journalistic quality. An open-ended question invited Australian participants (n=400) to note their reactions by expressing thoughts, feelings and considerations. A notable proportion of participants is sceptical or called it scaremongering. By contrast many expressed their frustration with deniers. Many participants said they feared for their family and the future. People felt angry, guilty, sad, ashamed, overwhelmed, disappointed, surprised, or confused, others were glad to learn that action was being taken. Many said action was urgently needed and worried that the world's leaders would not agree on timely solutions. Some said they found the article scary others found it boring. Some said it was hard to read, some said it was factual or interesting and others said they were uncertain about the information or worried about not knowing. The results suggest climate change denial lives but support for mitigation policies is widespread. The issue is highly emotional with fear dominating hopefulness, raising questions about future journalistic focus on solutions. This paper arises from an international collaboration and contributes to more nuanced understandings of public responses to climate change news.

Facts and Affects in Online Climate Denial: Towards a Model of Tribal Epistemology *Benjamin Glasson, University of Melbourne*

In the US, climate politics is highly polarised. Some 90 percent of liberal Democrats accept climate science, compared with around 30 percent of conservative Republicans. This 'tribal epistemology' has little to do with scientific literacy. It is becoming well-established that exposure to more climate science only galvanises climate deniers. As Dan Kahan and others have shown, climate epistemology is overdetermined by social acceptance; the emotional and even economic costs of holding a view at odds with one's peers overrides more objective concerns. This is especially true in climate denier circles, but also present amongst those who accept climate science. Climate change is only one dimension on which US society is polarising. Evidence of a deepening sociocultural divide marked by mutual antagonism is mounting and, although talk of a new post-truth era of 'alternative facts' is premature, the epistemological implications of polarisation are underexplored. In this paper, I attempt to describe how tribal epistemology works by drawing on my ethnography of climate-change discussion groups online. Exploring connections between the affective, libidinal, fantasmatic, performative and political-economic aspects of online climate discourse, I will offer the beginnings of a model of tribal epistemology that offers a richer explanation of the relationship between belonging and belief.

Session Organizer:
Heather Ford, University of New South Wales
Chair:
Heather Ford, University of New South Wales
Discussant:
Christopher Anderson, College of Staten Island, CUNY

213. Life, Biopolitics and Techno-identities 1
Single Paper Submission
Open Panel
2:00 to 3:30 pm
ICC: E3.5
Participants:

Recoding life: information and the biopolitical *Eric Deibel, Bilkent University*

Turning life into a technological object is an objective of a wide range of bioscientific knowledge practices that allow life to be known in ways that are saturated by how codes that can be shared (copied), owned (claimed and managed and optimized (remade through codes based on standard language and biotech engineering visions). Approaching the global implications of inevitably means dealing with such social heterogeneity and to do so this paper (re-)turns to Foucault's biopolitics, referring to the biopolitical in the title as a means to anchor the approach in political theories of sovereignty and related geopolitical conceptions of nature and society that these are premised on. This prevents that studying the continuity of genetic engineering by any other name – be it synthetic biology, nanotechnology or similar fields – in terms of an inventory of biopolitical dynamics, each of which insisting on its own version of a globalized world that is becoming politically and legally unstable and unpredictable. Rather, the paper seeks to argue that a critical reading of familiar languages of sovereignty reveals their embodied colonialism and thereby opens up a way for a range of studies that are able to reveal postcolonial patters, asymmetries as well as inherent instabilities that are being incorporated into the latest attempts to find in the life sciences and the fading of species bodies the means to escape ecological constraints and limits at a planetary scale.

The Operations Of The Familial Body: Genes, Family And Hereditary Cancer *Alison Monique Witchard, ANU*

In this paper, I offer a different approach to understanding women's experiences of living with hereditary breast or ovarian cancer syndrome. Rather than considering precancerous bodies as discrete 'individuals' that circulate and relate in networks with other discrete 'individual' bodies, I offer up a partial and porous body that is always relational. If we attend to fleshy life, the fleshy life of at-risk women and families, we see that it is hardly ever the whole body that acts, expresses and relates. It is elements or parts writ more or less significant to the occasion that come to act accordingly. Attending to partial relations is crucial to examining the lives of people dealing with the prospect of having parts of their bodies removed as a result of a genetic mutation. For my informants, particular body parts – namely breasts and ovaries – were drawn into the foreground by precancerous means. The cancerous potential of these body parts brought to attention their more usual backgroundness in the habitual actions and rhythms of everyday life that are constitutive of family. When these body parts had to be removed, women replaced them, or found new ways to participate in the body of the family as practitioners of partial relations. Informed by ethnographic fieldwork and the theories of Foucault (1977), Merleau-Ponty (1968) and Lyon and Barbalet (1994), I draw attention to partial deployments and what these reveal about the partial relations between bodies that are responsible for creating

and maintaining the institution we know as the 'family.'

Mediating biosocial possibilities: The deployment of biomedical technologies in HIV and viral hepatitis family disclosure narratives *Christy Newman, Centre for Social Research in Health, UNSW Sydney; Kerryn Drysdale, University of New South Wales; Asha Sofia Persson, UNSW Sydney; Jake Rance, University of New South Wales; Myra Hamilton, Social Policy Research Centre, UNSW; kylie valentine, UNSW; Joanne Bryant, Centre for Social Research in Health, UNSW; Jack Wallace, Burnet Institute*

As the management of blood borne viruses undergoes rapid change, the social dimensions of everyday care practices also transform, revealing a new set of productive tensions between the biopolitics of infectious diseases and the lifeworlds of the families they mediate. Drawing on interviews with individuals living with HIV, hepatitis C and/or hepatitis B, and their family members, the 'my health, our family' study is the first to document the role and experiences of families in the prevention, treatment and monitoring of these stigmatized infections in Australia. In this presentation, we explore the role of biomedical technologies in mediating family relationships, where the potentialities afforded by such technologies are often mobilized as an important device when disclosing a viral diagnosis to family members. Emerging findings suggest that biomedical therapies can operate as a technology of hope, providing family members with a concrete strategy for demonstrating support by informing themselves about management options or by getting involved in their family member's engagement with care. Accordingly, recent advances in biomedicine can be reviewed in both their enabling and constraining capacity in the family relationships they produce through these disclosure events. These findings point to the importance of better understanding and strengthening the role of families in the management of blood borne viruses, including their role in shaping the meanings and practices associated with biomedical technologies.

Expectations and disappointment for forensic technologies: A Comparative study on development of forensic DNA analysis *Mai Suzuki, The University of Tokyo*

The question of how development of science and technology is achieved has attracted STS researchers for many years, and the importance of expectations in science and technology innovation has been indicated in the recent much STS literature. Following the global trend of the sociology of expectations, this paper focuses upon forensic technologies and discusses how expectations for forensic technologies affect their future situations. Forensic technologies, especially forensic DNA analysis, are receiving a great amount of attention and several studies have revealed that expectations and critical scrutiny of forensic DNA analysis have encouraged its development. Through controversy over its credibility, DNA analysis seems to establish itself as a gold standard in forensic technologies all over the world (cf. Lynch et al. 2008); however, situations in Japan are slightly different. Based on the literature and interview research, this paper analyses how expectations and disappointment for forensic technologies varies between different countries, and describes how these differences, intertwined with various social factors (e.g., criminal justice system and regulation of forensic technologies),

exert an influence on the diverse development processes of forensic DNA analysis.

Old Wine in New Bottles? Forensic Anthropology and Metric Ancestry Estimation *Sarah Fruendt, Freiburg University*

In several countries, when an unidentified, strongly decomposed body is found, a forensic anthropologist will work the case. Part of his or her job is to establish a biological profile of the deceased, which usually includes sex, age, stature, and ancestry. For the latter, many practitioners use statistical computer software such as CRANID or FORDISC which support the estimation of ancestry based on cranial measurements and a comparison with their internal databases. By interviewing forensic anthropologists in several countries, and simultaneously gathering quantitative data with a tri-lingual online survey, I hope to shed light on how practitioners think about the application of these programmes and how they interpret the results. I am interested in what happens when these technologies leave the original context for which they were developed, and are employed in new national, social, and political circumstances, which, for example, are used to work with very different population categories. Secondly, I am investigating the compilation of the databases used for comparison, using both published and archived sources. What ideas about capturing human variation are they based on, and how did individual crania get assigned to categories? Here, I intent to show how most uncertainties of the sampling process become 'black-boxed' in the later database, creating a sense of certainty and objectivity in the actual user of the software. With my research, I hope to make a contribution to current STS debates regarding topics such as knowledge construction and societal interaction, locality and knowledge transfer, and knowledge and uncertainty.

Session Organizer:
Eric Deibel, Bilkent University

Chair:
Eric Deibel, Bilkent University

214. Global Perspectives on Responsible Innovation: Widening the Gaze II

Papers for Open Panels/Global Perspectives on Responsible Innovation: Widening the Gaze

Open Panel

2:00 to 3:30 pm

ICC: E3.6

Participants:

Pathways To Entrepreneurship: A Study Of Entrepreneurial Efforts Of Grassroots Innovators In Mechanical Engineering *Rollins John, Institute for Studies in Industrial Development,*

The study examines the outcomes and connections of preferences of the non-formal innovators scouted and supported by the Honey Bee Network (HBN) in India. Using secondary data and case studies from interviews of innovators who identify themselves as frugal innovators, we examine the system building efforts taken by HBN to help innovators diffuse their innovations. We examine the seminal features of innovators, the nature of their innovations, linkages and collaboration with S&T institutions and to what extent were they able to reach their proposed goals disseminating the innovation and knowledge. To trace the pathway taken towards diffusion, we have tried to understand the innovation's relation to the innovator's socio-economic backgrounds, triggers and

motivations, and characteristics of the product. In doing so, we study the pathway of inception, incubation, and diffusion of their ideas despite having minimal or negligible access to formal education. We found that a significant number of innovators required financial and technical investments to meet entrepreneurial aspirations and were highly likely to diffuse their innovation by sharing openly or by transferring their technology. Even though some innovators chose to venture into enterprise building, the region of diffusion was confined to the area in which they initially innovated. A select few were able to expand their business outside their locality. The Honey Bee Network shows great promise if it utilizes the strategies of collaboration and communal efforts by grassroots innovators to influence the local economy and society. Keywords: grassroots innovation, social movements, informal economy, inclusive innovation

Putting Responsibility Centre-Stage: The Case Of Responsible Stagnation. *Fabien Medvecky, University of Otago; Michiel Van Oudheusden, KU Leuven/ University of Liège.*

While Responsible Innovation (RI) is usually positioned as the antithesis of irresponsible innovation, a recent move has been to expolre Responsible Stagnation (RS) as alternative or complement to RI (de Saille & Medvecky, 2016). Our paper draws on RS as a counterpoint to RI as we thing through what we mean by responsibility in this space and what underlying values we hold. RS challenges the traditional rhetoric around the inherent value innovation, though maintains a commitment to responsibility in our science, technology, and innovation (STI) endeavours. In many ways, RS places responsibility centre-stage. And just as RI concieves of responsibility in terms of anticipatory, reflective, inclusively deliberative, and responsive (Owen et al., 2013), RS brings with it its own set of concepts and meanings. We begin this paper by considering what the concept of 'responsibility' means or looks like in RS? RS suggests that Innovation is not always or necessarily an unquestionable good, and by doing so invites us to revisit the values we espouse when pursuing our STI endeavours. But RS is not value neutral, and espouse some of its own values, So the second part of our paper asks: what are the underlying values of RS and how are they envisaged in the framework of RS?

Responsible Innovation and Transnational Governance in Neuroscience and Neurotechnology: A Comparative Perspective *Nina María Frahm, Technical University Munich, Munich Center for Technology in Society; Sebastian Michael Pfotenhauer, Technical University Munich*

Rapid progress in Neuroscience and Neurotechnology (NS/NT) raises several social and political issues (e.g. cognitive enhancement, dual use, neuroimaging and the law) that urge policy-makers to find appropriate governance frameworks for aligning neuroscientific innovation with societal needs, values and expectations. With brain research being on top of the agenda for countries across the world, calls are increasingly being raised for a better international coordination of NS/NT, as well as for a harmonization of neuroethical consultation and societal deliberation. As exemplified by current efforts of OECD's 'Neuroscience and Society' project, Responsible Innovation figures as a prominent and promising notion for building consensus among countries on how to govern innovation in NS/NT appropriately. This paper scrutinizes the mobilization of Responsible

Innovation frameworks for the global governance of NS/NT. Rather than understanding Responsible Innovation as a fixed set of discourses and practices, we aim to turn towards the variegated and situated national and regional cultures of integrating society into neuroscientific research and innovation. A comparative perspective on European and American brain projects alone reveals such substantial differences. In Europe, the emphasis has been on 'RRI' frameworks and corollary public engagement mechanisms for neuroscience. In contrast, the U.S. has focused primarily on ELSI frameworks and bioethical expert assessments, with a smaller role for lay publics. These differences become even more exigent when turning to other emerging neuroscience leaders such as Japan, China, or Cuba. We argue that for harmonizing the governance NS/NT, an appropriate model of subsidiarity is yet to emerge which maintains compatibility with local values and participatory cultures.

Translating "Responsible Innovation" in Australia *Peta Ashworth, The University Of Queensland; Semso Sehic, University of Queensland*

Unlike European countries "Responsible Innovation (RI)" is very much a nascent concept in Australia. Therefore, examining RI in the Australian context creates both expectations and scepticism about the value it might bring to Australia's innovation agenda. Such a mixed response is not surprising as many Australian science and research institutions are under increasing pressure from government and other stakeholders to improve their performance and overall effectiveness. This paper explores the concept of RI emerging from 35 interviews conducted with a range of actors across Australia's research and innovation landscape. As part of an EU Horizon 2020 project, the research focused on the term "Responsible Research and Innovation (RRI)". While exploring the meaning and interpretation of RRI, different notions of 'responsibility' emerged. Such differences appear to be predominantly influenced by the organisation type – whether they are a research funder or research deliverer and whether part of the private sector or public good research. Across the interviews there was agreement about the need to establish an accepted definition of the term "responsible" and the context it is used. The discussion touched on questions such as: To whom are we responsible? How are we responsible? Who is responsible? And what is the role of science within this context? No single answer to these questions was arrived at. It was agreed, however, that how we choose to answer these questions will largely influence the likely response to RI in Australia. The implications for local innovation policy and global RI will be discussed.

Session Organizers:
Sebastian Michael Pfotenhauer, Technical University Munich
Nina María Frahm, Technical University Munich, Munich Center for Technology in Society

215. If a Body Meet a Body: Making People in Daily Practice
Papers for Open Panels/If a body meet a body: making people in daily practice
Open Panel
2:00 to 3:30 pm
ICC: E3.8
Social studies of science and technology have paid much attention to the material practices that act upon and interact with the body in

prominent technoscientific areas such as medical institutions (Foucault, 1963; Mol, 2002), statistical records (Hacking, 1985), information and communication technology (Balsamo, 1996; Haraway, 1991), medical operations (Hirschauer, 1991; Prentice, 2012), and genetic testing (Nelson, 2016). Far less interest has been directed towards less visible and more quotidian forms of bodywork: how bodies are produced and enacted in smaller scale interactions, and how such bodies travel between, or communicate between, various organisational structures beyond the clinic, the lab, or the nation-state. This track invites papers on how bodies are made, changed, experienced, maintained, resisted, and unmade through mundane technoscientific practices. We welcome papers, films, performances, and other formats that address ideas relating to, but not limited to, how bodies are audio-visually mediated, digitally or physically modelled, mimicked, reproduced, categorised and mapped (across a variety material practices and forms of knowing) and what the effects are of such practices on conceptions of the embodied self, subjectivity, and social identity. In addition, we invite presentations engaging with commonplace body techniques such as (un)dressing, gesturing, posing, and walking, and how such actions contribute to the establishment and potential subversion of social norms and identities.

Participants:

Nobody Knows What a Body Can Do: un/making the mediated body *Scott East, UNSW Sydney; Karen Kriss Karen Kriss, UNSW Sydney Art & Design*

Motion capture (mo-cap) technology is increasingly used to convey the sense of real bodies in cinematic and gaming representations. However, most audiences do not perceive any trace of the actual body that produced the movements in the studio. Legacies of STS provide a framework to critically analyse blackboxed technology revealing the normative assumptions mo-cap is premised on: understandings of what bodies are and how they move (consider the calibration tests needed to synchronise mo-cap systems). Tobin Siebers in his polemic 'Disability Aesthetics' understands the aesthetic as the impact of some bodies on other bodies (2006 & 2010). Thinking of bodies coming together through motion capture technology is a means of extending our understandings of what bodies are and can do. Deleuze drawing on Spinoza in his essay "What Can a Body Do?" sees these two questions of bodily structure and capacity as equivalent, reminding us that "we do not even know of what a body is capable" (1990: 226). This creative presentation will present preliminary findings from a research project which has used mo-cap as a means of artistic expression for people living with a disability.

Reinventing the Heel: Technoscientific Interventions in Fashion Footwear *Christopher Hesselbein, Cornell University STS*

As previous research in feminist STS has argued, objects, bodies and identities emerge through a process of co-construction. One of the most ubiquitous material practices in many modern cultures is the act of wearing and walking in shoes. Putting on shoes can be understood as a point of contact between an individual's physical foot and the standardised model of a social foot. As any shoe wearer will tell you, this meeting between body, design, and society is not always a felicitous one. My paper explores the concepts of fit, comfort, health, and beauty as they intersect with the material performance of gender with a particular focus on the reinvention of the 'comfortable high heel'. This continuous cycle of invention and modification as recently intensified with the

emergence of mobile foot-scanning technologies, female footwear designers, and podiatrist-entrepreneurs. Through narratives of hi-tech customisation and technoscientific progress, these new designs purport to prevent the long-term health effects previously associated with high-heeled footwear while maintaining the longstanding association of the high heel with femininity and professionalism. This case study of how the reinvented high heel attempts to subvert a harmful body regime while maintaining a traditional gender norm shows not just how gender and technology are co-constructed, but also how beauty standards are as much worn on the body as they are in the body through the enactment of the feminine walk and, potentially, the clinical body.

Tearoom Trade: Buildings, Bodies, Sex *Janice M. Irvine, University of Massachusetts*

Laud Humphreys' 1970 text, Tearoom Trade: Impersonal Sex in Public Places, is a sociological classic. But the book's rich ethnographic analysis of how men accomplished what Humphreys called "instant sex" has long been overshadowed by allegations of ethical violations. This paper refocuses attention onto Humphreys' important theoretical contributions to sexuality studies, with a particular focus on two aspects of the study. First, it examines Humphreys' discussion of the buildings themselves and ways in which men repurposed them as sites conducive to sexual activity by removing cubicle doors, cutting "glory holes," and breaking windows for lookouts. An important contribution of the study was exploration of how sexual practices are constructed by, and lived out within, specific places. Humphreys himself quipped that some men were more attached to the buildings than to the men with whom they had casual sex. Second, the paper discusses Humphreys' analysis of the tearoom encounters themselves, including the rules of interaction such as approaching, signaling, contracting, and dealing with intrusions. Humphreys' mentor wrote that the book shows "how socially constructed patterns of use of time, space, technological resources, information, and interpersonal contacts" together produce the "ordinary" public restroom as a sexual site. This paper uses Tearoom Trade as a case study to argue that the epistemic principles and methodological practices of mid-20th century "deviance" studies anticipated later intellectual advances of social constructionism, cultural studies, STS, and feminist-queer studies, for example the focus on performances, places, and a fluid approach to identities.

Who's Listening? Practices of social justice listening within an advocacy coalition for policy change around hearing and deafness *Nicole Matthews, Macquarie University; Justine Lloyd, Macquarie University*

We examine the Breaking the Sound Barrier (BSB) lobbying campaign which aims to shape hearing health policy in the Australian context as an example of social justice listening. BSB has developed an agenda agreed on by a range of Deaf community organisations, hearing loss charities, hearing aid manufacturers and audiology associations. The campaign was launched at the National Deafness Sector Summit in 2016, after which it was presented to parliament with the aim of making hearing loss an official National Health Priority, and is ongoing via face-to-face lobbying, mainstream and social media. This campaign brings together groups with longstanding

fundamental differences in the ways that they frame their membership and develop claims based on personal experience and scientific authority. Organisations representing sign language-using Deaf people, for example, frame Deafness as a cultural identity centred on a shared community language, rather than Deafness as a health difficulty or disability. Deaf culture organisations emphasise the importance of accessible communication and services, such as captioned media or access to sign language interpreters, from a standpoint of Deafness not as 'hearing loss' but as 'Deaf gain'. Deaf culture organisations have been critical of emphases on technologies, such as hearing aids or cochlear implants, as a 'solution' to Deafness. In contrast, audiology professional bodies and charitable organisations have understood hearing through concepts such as 'hearing loss'. These differences make this advocacy coalition of particular significance to understanding how claims for social justice arise within contestations of policy and expert knowledge.

You Ain't Nothin But a ___: Modelling, Manufacturing, Standardising, and Enacting Elvis Presley in Regional NSW *Sahar Tavakoli, Cornell University STS*

The August Krogh principle – often cited as the basis for model organism selection and use - states that for any question raised within the biological sciences, there is some single organism best suited to its answering. Once identified and manufactured, such organisms move between physical locations, between disciplines, and between individuals, assisting in the establishment of infrastructures, communication systems, and material exchange. But how are such organisms first identified, how are they constructed, how are they standardised, and how are they then used to position some bodies against or amongst others? In this paper, I will describe how the town of Parkes, NSW, Australia, has standardised the body of Elvis Presley in order to achieve many of the same aims as model organisms within biological lab spaces. Comparing ethnographic notes from Parkes against this larger notion of the model organism, I will ask how the body of Presley is constructed and standardised in order to move between locations, communicate between state organisations, and between Parkes individuals. Bringing together notions of boundary objects (Star and Greisemer), standardised packages (Fujimura), ethnographies of knowing subjects (Mialet), and my own field notes, I aim to present an instance in which classically STS studies of laboratories are able to move far outside of formal scientific settings, considering not only how we might see the social practices of community building and communication in the scientific but also the scientific practices of organism manufacture and standardisation in the social.

Session Organizers:
Christopher Hesselbein, Cornell University STS
Sahar Tavakoli, Cornell University STS
Discussant:
Trevor John Pinch, Cornell University

216. The Impact of Outsourcing and Contracting on Accident Prevention in Complex Sociotechnical Systems (2)
Papers for Open Panels/The impact of outsourcing and contracting on accident prevention in complex sociotechnical systems
Open Panel
2:00 to 3:30 pm

ICC: E3.9
Social studies of disasters in complex sociotechnical systems are well established (Challenger, Deepwater Horizon, Fukushima etc). Such events are best seen as 'organizational accidents'. Prevention requires a focus on how work is structured at an organisational level as described in high reliability theory and other similar theories of accident causation and prevention. Many of these theories originate in the 1990s or earlier. Since that time, the way work is organised has changed substantially with outsourcing / subcontracting becoming the norm. These practices introduce new forms of distribution of work and labour, and bring new spatial, temporal and inter-organizational boundaries that must be managed. The impact of global trends to outsourcing /contracting on the potential for disaster has been little studied. Keeping a complex sociotechnical system safe is a long term endeavour that requires more and more articulation of work between organizations. Such a 'dynamic non-event' poses particular challenges given the potentially short term and transnational nature of contract relationships and the variety of interests involved. This panel aims at better understanding how safety (and reliability) can be achieved in these distributed (and often singular) settings.
Participants:

Outsourcing Risk Governance *Jan Hayes; Dolruedee Kramnaimuang King, University of Sydney; Lynne Chester, University of Sydney*

Studies on the nature of work have highlighted the increased risk to worker safety as a result of outsourcing and subcontracting, partly because complex employment arrangements make regulatory oversight difficult. What has received less scholarly attention is the trend towards outsourcing by regulatory agencies themselves. This paper draws on two examples taken from the gas pipeline industry in Australia to investigate this trend. In both cases, lack of skilled regulatory resources has resulted in use of specialist consultants to review company technical compliance. In one case, safety regulators rely on supposedly independent auditors to examine field work practices for regulatory compliance. Such auditors are hired and paid by the companies involved, in line with the neoliberal principle of 'user pays'. The second case involves consultants employed by the economic regulator to review company proposals for expenditure on pipeline integrity. Acceptance of such proposals impacts the cost of gas supply to consumers. Consultants are effectively tasked with finding ways to reduce proposed expenditure, even for safety related items. In both cases, consultants produce work that favours those paying the bill. Regulatory agencies without the capacity to critically examine the recommendations uncritically accept outsourced advice. Risk governance in this context is important for public safety. No models of effective governance take into account outsourcing of regulatory functions and yet it seems to be a developing trend with the possibility of significantly impacting regulatory outcomes.

Organisational Complexity and Subcontracting Management: Confronting Lessons from Accidents and from Normal Functioning Safety Assessment *Nicolas Dechy, Institut de Radioprotection et de Sûreté Nucléaire; Alexandre Largier, Institut de Radioprotection et de Sûreté Nucléaire*

Lessons of industrial accidents in the seventies and eighties provided the basis for the theorization of organizational failures and later the concept of "organizational accidents". Further research and later

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accidents have shown the inter-organizational dimensions of accidents especially with the involvement of subcontractors. Other research, such as by High Reliability Organisations specialists pointed to the coordination challenges, the interstitial spaces and gaps to fill. In addition, a general trend of massive subcontracting and globalization has raised issues of organizational complexity management and raised doubts on risk management and governance. This debate is also highly controversial with opposition from trade-unions that highlight production pressures and risk transfer to workers' labour conditions. Aside from the political and societal debate, the issue is rather that safety analysts, managers and regulators should consider factors that are required for safe performance of industrial processes and potential limits of risk management under this organization of work. In this paper, our goal is to address those influence factors, either positive or negative, with a twofold strategy, with lessons from accidents on one side and lessons from normal functioning safety assessment. Our analysis will draw on the lessons from accidents, especially on organizational complexity, subcontracting and several normal functioning safety assessments IRSN performed these last 5 years on maintenance outages and subcontracting management that provided foundations for safety regulation. The discussion will help to analytically confront some key lessons and provide a synthesised view on knowledge gaps and challenges between performance factors and vulnerability patterns.

Ambiguous Reliability in Temporal and Outsourced Utility Construction Operations *Leon olde Scholtenhuis, University of Twente*

Utility construction operations are a typical example of outsourcing. Reconstruction of roads, water, gas, and telecommunication networks, for example, involve distinctive clients, engineering firms, and trade contractors. Although these organizations execute work concurrently in the same physical space, each technical discipline mostly designs and plans construction work individually. Distinctive stakeholders are responsible for the design, engineering and execution of the construction operations. Moreover, no stakeholder has the hierarchical control over the interrelated construction operations. This fragmentation challenges reliability – i.e. avoidance of unwanted unexpected situations. High Reliability Organizing assumes that reliability routines are established around organizational units. Although settings around utility construction operations can be considered as (a loosely coupled) organizational unit, it remains an empirical question to date whether HRO-routines establish in these settings. To explore whether and how utility streetworks organizations aim for reliable performance; we interviewed stakeholders of two urban utility streetworks projects. Based on this, we developed descriptive narratives about how they collectively dealt with operational (near) misses. These narratives were compared with HRO principles (pre-occupation with failure, reluctance to simplification, sensitivity to operations, commitment to resilience, and deference to expertise). We found that privatization of the utility sector not only fragmented utility network ownership, but that it also created ambiguity about the responsibility for reliable planning and execution of streetworks projects.

Session Organizer:

Jan Hayes
Chair:
stéphanie tillement, IMT Atlantique Nantes

217. Social Studies of Politics: State Affect? 1
Papers for Open Panels/Social studies of politics: state affect?
Open Panel
2:00 to 3:30 pm
ICC: E5.1
Whether in post-industrialized settings of the Global North or the rapidly industrializing contexts of the Global South, a distinctive feature of our contemporary world is the reconfigured but nonetheless pervasive presence of states. The state remains a key mode of societal organisation, despite scholars announcing its "death" or decrying that it is "hollowed-out" as states purportedly contribute to their own undoing in the context of ever-advancing globalization and the contruction and transformation of inter- and transnational modes of governing. Research in Science and Technology Studies (STS) tends to privilege technoscientific advances organized through deliberate (nation) state intercession, either through co-shaping of science and society (Jasanoff) or through intervention into the material environment and through the establishment of infrastructure (e.g., Carroll, 2009; Mukerji, 1997). An under-explored though essential facet for understanding contemporary politics is affect. How is state affect marshaled in the face of pressures to retreat and to expand? The care and attention that laypeople and officials direct at operations of the state and bureaucratic labor offer a means of locating the sustenance of the state in terms of affect. Bringing this conceptual terrain into prolonged conversation with Science and Technology Studies (STS) affords scholars the opportunity to examine how the 'sensibility' of states is produced even in transnational configurations and how a range of affective dimensions (aesthetic, aural, optic, and even olfactory) come to be entangled with diverse regulatory and administrative processes in the 'care' of national, international and transnational government work.

Participants:

Comparison and Analysis of the Research Supporting Pattern in Think Tanks *Chunjie Liu, Institute of Science and Development, Chinese Academy of Science; Jianzhong Zhou, Institutes of Science and Development, Chinese Academy of Sciences; Lu Zhao, Chinese Academy of Science*

With the continuous realization of improving the government's scientific decision-making, think tank play an important role in associate with the national governance system in order to guarantee the ability to govern. Excellent think tanks should take the responsibility of being the intelligence link between science, technology and society. In this research through literature review, visits and interviews of some well-known distinct think tanks such as the Royal Society, the National Research Council, Chinese Academy of Engineering, , Chinese Institute Fudan University, etc., the common and distinct characteristics in their operations and research supporting patterns are summarized. We classify these think tanks into three types: Channel platform, knowledge complementary platform and integrated platform. This paper also summarized the effective research supporting patterns that generated through daily experience in Chinese Academy of Science, which are firstly the fellows led and research supporting centres facilitated research supporting pattern, secondly research management pattern, thirdly academic service supporting pattern and lastly independent research based

supporting pattern. The experiences and advice we draw from the comparison and analysis above are firstly the work procedures and system need further standardization. Secondly research topic selection should consider both decision-making demand and independent research in order to promote the fit between consulting results and needs of decision-making. Thirdly ensure that policy recommendations are integrated, impartial and scientific. Lastly we should pay attention to the communication of results and promote the social influence. Keywords: Think Tank, Research Supporting Pattern,Governance Capacity

Dangerous Cultures: Affective Safety Culture and the Work of Remediation at the Hanford Site *Pedro Eduardo de la Torre, John Jay College of Criminal Justice, CUNY*

A sudden olfactory, gustatory, or somatic assault—the odor or taste of dill pickles, or burning lungs—may signal the presence of toxic vapors belched from large, underground tanks storing a complex stew of waste left over from the Manhattan Project or Cold War era processing of spent fuel rod in to weapons-grade plutonium. A project engineer and a nuclear safety manager are terminated after raising safety concerns about designs for a facility that will turn this waste into glass for safer disposal. In the aftermath of these kinds of incidents at the Hanford Site on the Columbia Plateau, calls for studying and reforming the "safety culture" of this former nuclear weapons complex, which is currently undergoing extensive environmental remediation by the U.S. Department of Energy, proliferate. As what it is perhaps the most prominent lens within official discourses for the enlightened management of risky institutions, this paper will examine "safety culture" as a contested framework for regulating sentiments such as fear and suspicion both inside and outside the gates of dangerous industrial operations. In this case, efforts around "safety culture" often reinforce an imaginary of a coherent state in control of the material legacies of nuclear militarism, even as bodily encounters with these legacies is surrounded by suspicion.

Deliberations on Intellectual Property Rights in Indian Parliament: Contestation of Social Values through Political Negotiations *Deep Jyoti Francis, Jawaharlal Nehru University*

North (1990) has viewed parliament as a place where transactions and discussions on policies take place. The political systems are viewed to be rationally devised and rationally employed, which is to say that they are appropriate instruments for the fulfillment of desires of members of the society (Stigler, 1971) and democracy has been observed as a move towards achieving greater political efficiency (North, 1990). North (1995; 2003; 1994, p. 360) introduced two forms of institutions – formal and informal, where he argues for the constraining role of institutions on human behavior vis-a-vis informal institutions in decision making. The literature on institutions has emphasized on the issue of complementarity where the transferred formal institution may not be in complementarity with already existing institutions. Intellectual Property Rights (IPRs) is one such global standard institution, which has been transferred and homogenized across the world. Given India's prevalent caste system and income inequality, the political parties in India are backed by interests of diverse sections of the society. In order to identify various social values promoted and preserved by the various political parties, this study carries out content analysis of discourse on Patent Bills and Copyright Bills. We observe that despite the pressure of adopting strong IPR, several regional political parties have repeatedly argued for social values not prominently brought forward by national level political parties, whereas, in case of a coalition government, regional parties have been able to translate these values into policy. Such discrepancies in values surrounding IPR thereby underline the existing non-complementarity between the institution of IPR and the prevailing Informal and formal institutions.

The need for a "social studies of politics" in STS *Nicholas James Rowland, The Pennsylvania State University; Jan-Hendrik Passoth, Technische Universität München; Govind Gopakumar, Concordia University*

The social studies of science and the social studies of finance have been a productive shift in STS to make advances in the scholarly understanding of science and economics "in action." In STS, the "social studies of …" shifts amount to careful, empirical attention toward the construction of facts, artifacts, and tools with special emphasis on the interface where materiality and practice meet. Currently, literature on "the state" in STS tends to privilege the "co-production" perspective, which depicts the state (or government) in a dynamic role with science (or technoscience), wherein the empirical puzzle is largely satisfied once the mutual influence of science on society and society on science has been demonstrated through detailed analysis. The co-production insight, born of 1990s theorizing, has been an outstanding source of productivity in STS and beyond, especially noteworthy for drawing much needed outside attention to the small world that STS inhabits. That said, the theoretical impact of co-production is at its limit and now, for politics to play a continued and central role in STS, there is need of fresh insight into the inner material and human dimension of "making things political" and, therefore, a social studies of politics. Just as the social studies of science moved beyond the co-production of science and society and just as the social studies of economics moved beyond the co-production of economic science and society, the social studies of politics is needed to move beyond current stagnation regarding the co-production of science and the state.

Session Organizers:
Jan-Hendrik Passoth, Technische Universität München
Nicholas James Rowland, The Pennsylvania State University
Chair:
Jan-Hendrik Passoth, Technische Universität München

218. Extractivism, Conservation, Science and Justice: Workshopping Emerging Approaches in Decolonial Science
Closed Panels
Traditional (Closed) Panel
2:00 to 3:30 pm
ICC: E5.10

What can science studies offer researchers who need to respond to the appropriation of scientific expertise for the purposes of authorising political decisions that have destructive effects on people? What forms of scholarship could contest "ecological sciences" that make possible destructive interventions, programs, and policies? What do decolonial and postcolonial approaches

bring to research that addresses the appropriation of scientific expertise for the purposes of authorising extractive and violent relationships within ecologies? What forms of scholarship could contest "ecological sciences" that make possible destructive interventions, programs and policies, without recreating "the science wars" of the past few decades ? This panel brings together graduate researchers from Southern Africa, Guatemala and Chile to consider how to respond to the particular kinds of structural violence that attend interventions in "sacrifice zones", including mining, conservation, water management and wind energy. Our interest in framing this panel is to offer scholars who are new to science studies an opportunity to reflect collectively on strategies of a wide range of activists for responding to environmental governance science via deinstitutionalizing or counter-institutionalizing specific appropriations of science(s) that are recognized as unfair to communities and localities.

Participants:

Human and non-human "undesirables" in hydrological framing of Cape Town's Kuils River *Nikiwe Solomon, University of Cape Town*

Using the Kuils River as a case study, this paper reflects on the human-river relationship in the history of the Cape Town metropole. Drawn from ethnographic research, the paper explores the ways of relating between the various actors and how they have enacted the Kuils River in relation to the city's history. The paper demonstrates that in South Africa, the history of the discourse around water management is often highly anthropocentric, centered on logics of science authority and technical efficiency, assuming a singular viewpoint from which to develop and implement solutions. However, even hydrological approaches to water are not free of socio-cultural values and the Kuils River case study demonstrates this. The threat of the poor water quality, poor service delivery and tensions arising from inherited colonial spatial planning and development agendas have generated conflicts between nature, science, techno-efficiency, legal instruments and politics. Through looking specifically at the river course, in recent history and now -- through aerial photos, early maps as well as oral narratives, the paper traces the river's entanglements with the city. The paper looks at the history of the ecologies of practice along the Kuils, the role of power, becoming, belonging, subsistence and livelihoods on the urban periphery, with a particular focus on the "undesirables" (both human and non-human) and waste streams in the socio-technical and hydrological understanding of the river. It explores the efforts to manage and control the expansion of these "undesirables" beyond allocated spaces of the Cape Town metropole.

Windscapes and Socio-technical imaginaries of the Tsitsikamma Community Wind Farm, South Africa *Michelle Pressend, University of Cape Town*

South Africa, a country highly dependent on coal for its electricity generation and that has significant coal reserves initiated a large-scale renewable energy programme. The Renewable Energy Independent Power Producer Procurement Programme (REI4P) implemented in 2011 assumes that by including some criteria for local economic development and social economic development, enterprise development and local ownership that should be met from contributions from the project's revenue, local well-being will be improved together with climate mitigation. This study explores the sociotechnical

imagination of "community benefit" in the Tsitsikamma Community Wind Farm, considered to a 'model' project under REI4P.

Conservation and Expulsion: The Sikumi Forest Reserve in Zimbabwe 1 *Tafadzwa Mushonga, University of Cape Town; Frank Matose, University of Cape Town*

It is an overstatement to say there is a war for conservation or that conservation-scapes are deadly landscapes in the Zimbabwean forestry context. Undeniable, however, is a case of post independence resource-based or green violence against society which follows a tradition of violent expulsions since the forest reservation era. Today's violence is a product of structural effects of colonial forest regulations and policies, and scientific discourses on sustainable yield forest management inherited with minor changes by the post independence Forestry Commission. Using the case of Sikumi Forest Reserve in Zimbabwe, we explore how communities living adjacent the forest continue to be denied resource access on the basis of scientific conservation and how violence is unfolding. We discuss emerging forms of green violence and whether conservation in this context necessarily requires the expulsion of people. The question arises as to what forms a decolonial conservation science might take.

Protecting a "pristine biodiversity" on Mount Mabu: Constructing Divides and Marginalizing Local Worlds 1 *Anselmo Matusse, University of Cape Town*

Mount Mabu became popular when in 2009 a group of scientists from the Kew Botanical Gardens first noticed it using Google Earth. It has since then been considered a "lost Eden on Earth" and "untouched by Man". This has attracted a number of national and international scientists and NGOs who are interested in turning Mount Mabu into a conservation area. Currently, two NGOs, namely RADEZA – a local NGO and Justica Ambiental – Friends of Earth Mozambique are struggling to turn Mount Mabu into a conservation area, the first as a National Park and the latter as a Community Conservation Area. Both NGOs, Scientists and State officials frame the Mountain and the forest around it as a being separate from humans, a resource out there that needs to be protected. While these actors focus on the nature side, which is inherent to Western environmentalism, they fail to notice the wealth of relationships that cross the nature-culture divide which characterize the daily lives of local communities. Based on 11-months (and counting) worth of ethnographic data, during which interviews with state officials, NGOs, local leaders and community members as well as direct observations were carried out, this work will dwell on these different worlds that were put side by side by the power of capital and science and their possible repercussions on the future of the Mountain and the communities living with it.

Session Organizers:
Lesley J F Green, University of Cape Town
Gloria Baigorrotegui, Instituto de Estudios Avanzados - Usach
Kristina Lyons, University of Pennsylvania

Discussant:
Sebastian Ureta, Universidad Alberto Hurtado

219. Science, Technology and Society in the Polar Regions (1)
Papers for Open Panels/Science, technology and society in the polar regions

SATURDAY

Open Panel
2:00 to 3:30 pm
ICC: E5.2
Despite Antarctica being widely regarded as the paradigmatic "continent for science" since the late 1950s and the Arctic being narrated as one of the most important "laboratories" for studying environmental change in the age of the anthropocene, STS scholarship on the polar regions remains comparatively underdeveloped. The aim of this panel is to explore more analytical discussions concerning science and technology as agents of authority and power over both people, animals and places, considering how the Arctic and the Antarctic are governed, controlled, and exploited. We are particularly concerned with challenging the notion that the polar regions are conceptually separate from the rest of the globe and with, alternately, emphasizing how practices, prejudices, and preoccupations flow across lines of latitude. The kind of questions relating to the co-production of science, technology and global and local societies which the panel aims to contribute to include: How do national science programs enact sovereignty within legal frameworks that either complicate or sideline territorial claims? How does environmental monitoring construct images of fragility? What work does the rhetorical conflation of science with environmental protection do in obscuring other connections, such as those between science and subsurface mineral extraction? To what extent does traditional ecological knowledge in multilateral Arctic governance influence epistemological formations in Arctic sciences? This first panel answers these questions by focusing particularly on the change and changing aspects of multispecies relations in the poles.

Participants:

Antarctica: A Pharmacopea of Genetic Material *Juan Francisco Salazar, Western Sydney University*

This paper is informed by short-term ethnographic fieldwork in the Antarctic Peninsula with Chilean microbiologists engaged in the bioprospecting of extremophiles, to account for how extremophile organisms are made part of a market-driven search for bioactive components in areas highly sensitive to geopolitics at the same time as they become meaningful as proxies for extraterrestrial life. The paper combines analysis, description, and fieldwork material, tracing the relational trajectories of Antarctica and outer space in very general terms and then discussing the intricacies of bioprospecting in Antarctica, where the question of who owns the microbial diversity existing outside of national territories remains ambiguous and contested.

Against Otherworldliness: 'Placing' the Arctic in the Anthropocene *Alexis Rider, University of Pennsylvania*

My proposed paper compares two moments of technological and scientific activity on the Arctic archipelago of Svalbard. While seemingly disparate both temporally and intentionally, I use these two historical moments as an opportunity to explore, and re-consider, the purported 'otherworldliness' that is often associated with the region. I first consider the marble mining town of Ny London, established by Briton Ernest Mansfield in 1908 when the archipelago was 'terra nullius.' Mansfield hoped to incorporate the rare and exceptional Arctic marble into the growing global system of capital but, when the rock was brought south, the thawing permafrost destroyed it. I then consider a scientific expedition that took place a century later, when in 2007 NASA launched AMASE—the Arctic Mars Analog Svalbard Expedition.

For NASA, the "extreme environment" of Svalbard is quite literally 'otherworldly,' seen as an opportunity to experience and imagine a different planet. Whether terra nullius or extra-terrestrial, Svalbard is seen by these actors as spatially and geologically Other. Challenging this logic, I use these examples to consider the relationship between place and scientific knowledge-making. Advancing the spatial turn in STS, I move beyond lab/field dichotomies to consider how place is "a resource scientists use to create their scientific objects as such" (Messeri, Placing Outer Space, p.15). I then argue that for both Mansfield and NASA, Svalbard is used to produce two different but important senses of "the planetary." I then suggest that considering different registers of the planetary can be useful in understanding the scale of the Anthropocene.

Mattering the Economy *Kristin Asdal, TIK, Centre for Technology, Innovation and Culture; Tone Huse, TIK Centre for Technology, Innovation and Culture, University of Oslo*

In recent years, STS scholars have increasingly turned to the study of markets and 'the economy'. Alongside this, there is also a growing interest in what is often labelled 'the bio-economy', and how this emerging economy works to link biosciences, biotechnology, markets and capitalism. Analysing how the North Atlantic Cod is increasingly enrolled in a particular version of the bio-economy, the paper takes these two bodies of literature as its point of departure, but will focus upon a set of challenges: How to capture 'the bio' in these economies? First, how to capture the fact that seafood industries are not simply about markets, but crucially also about living entities that go by their own instincts. How does their materiality and biology matter? Surprisingly, and despite an expressed interest in the non-human, this aspect often seems to get lost in the market turn in STS. Hence, the paper is about what we label 'mattering the economy', whereby we link the problematic of market making to the examination of how matter - the living as well as the slaughtered - intervene and make a difference to economies and market making.

Why Did Norway Ban Polar Bear Hunting? *Peder Roberts, KTH Royal Institute of Technology*

This paper explores why Svalbard's polar bears went from being considered legitimate subjects of hunting for both commerce and pleasure to being fully protected under Norwegian law within a decade in the 1960s and 70s. I begin by sketching the array of cultural and economic values attached to polar bear hunting at mid-century. In addition to underpinning a commercial hunt that legitimized Norwegian sovereignty over Svalbard, polar bears were characterized as supplemental sources of entertainment and income for staff at meteorological stations (who were difficult to recruit) and as pests that damaged seal populations and thus undermined another industry. Even as concern over polar bear numbers grew elsewhere in the circumpolar north, Norwegian authorities hesitated to restrict hunting, even accepting arguments that it was necessary to maintain an ecological balance. I argue that the comparatively rapid change in opinion toward the end of the 1960s cannot be reduced to greater knowledge of bear populations and ecology – although this was certainly a factor. Rather, it must be linked to political shifts (notably Norwegian desires for multilateral political agreements covering Arctic issues) and to a

decline in the cultural and economic value of polar bear hunting that reconfigured the calculus for regulation. An approach grounded in critical analysis of how values are inscribed upon polar bears helps illuminate this specific example while also suggesting fruitful new insights upon the wider question of how polar environments came to be regarded as fragile spaces in need of management and protection.

Session Organizer:
Justiina Dahl, KTH Royal Institute of Technology

220. Climate Technologies and Unintended Consequences 1
Papers for Open Panels/Climate Technologies and Unintended Consequences
Open Panel
2:00 to 3:30 pm
ICC: E5.3

Climate technologies' can be defined as those technologies which are designed to help prevent or deal with climate change. This includes technologies such as renewables, biofuels, geoengineering, carbon trading, carbon capture and so on. The purpose of this panel is to explore the likely unintended consequences of these technologies for society, ecologies, other technological systems and so on, and the unintended effects of social processes on these technologies. What might we have to look out for? How do we factor in unexpected consequences? How do we limit such factors? Approaches from any theoretical and disciplinary perspective are welcome.

Participants:

Assessing the Contestation in Biofuel Production Approaches in India *Rahul Shukla, Indian Institute of Technology Guwahati; Sambit Mallick, Indian Institute of Technology Guwahati*

The paper attempts to examine the emergence and trajectory of the biofuels in India by comparing its development in the two Indian States namely-Chhattisgarh and Karnataka. The present study is cross-cultural in nature as it takes the case of the two States where biofuels have diverging trajectories of production. This comparison of the two societies different in their economy, geography, culture, polity etc. poses different queries: o How do various socioeconomic and politico-cultural factors influence the production of knowledge and its application in biofuels in India? o What are the differences and similarities shared by the socio-technological systems in biofuel production in India? Keeping the research objectives in mind, data were collected through a combination of discussions, in-depth interviews, and personal observation. The study focuses on cultures and practices of science and technology because these have major implications for both, how science and technology are perceived in policy terms and their ability to deliver the goods to the farming community at one end, and on the other, a greater access of energy for larger community. The study is anchored in the discipline of sociology of science and technology (SST), and draws theoretical understanding particularly from "social construction of technology" (Pinch and Bijker 1987; Bijker 1995) and "actor-network theory" (Law and Callon 1992; Latour 2005). The study contributes to existing literature of SST by implementing its methods and strategies germane for energy-agriculture interaction, and further, it may extend the rubric of socio-energy in the case of biofuel production in India.

Cows as climate technologies: mapping cow-climate-human relations *Lauren Rickards, RMIT University; Donna Houston, Macquarie Uni; Andrew McGregor, Macquarie Uni*

"Climate technologies" are not just about shiny bits of kit; they are also about the dirty, the tasty, the organismic and the metabolic. This paper highlights the climate technologies being used in turn to shape cows and their complex internal and external ecologies into physico-political technologies, from the molecular to global levels. As debates about climate diets indicate, cows are becoming key figures in the climate change imaginary, not only because they are often a means of scraping income off increasingly climate exposed landscapes, but because their very breath needs to be recomposed and their hoofs' microecological effects managed if climate mitigation goals are to be reached. Reframing cows as both cyborgs and environmental infrastructure, these technologies position them as atmosphere-biosphere intermediaries that in aggregate promise to effect the Earth's future habitability. Yet just as terraforming the Earth with cows has already had unintended consequences, so too will efforts to rework cow bodies and herds into a more climate-friendly form. In this paper, we map the climate-cow relations being forged through competing propositions and altered through intersecting technologies and practices. We speculate on what their effects may be, not just for multispecies farm figures, but for cow-human relations beyond the farm, notably the distant urbanites who once dined on meat care-free. Understanding how cows and climate are becoming ever more tightly entwined via their shared entanglement with humans – variably equipped with microbial vaccines, genetic shears, seaweed, grazing plans, frying pans and vegan recipes - offers insights into the many sources, sites and subjects of climate change's unintended consequences.

Dreaming of a European Saharan Sun : A political ecology of big solar in Africa *Paul Munro, University of New South Wales*

Given its viability for small-scale applications, solar power has often been proffered as an exemplar of Schumacher's 'appropriate technology.' As an opportunity for Africa, and other parts of the developing world, to leap-frog modernist grid-based electricity initiatives towards village-level energy revolutions; as an opportunity to create the space for locally controlled, owned and operated energy systems. And while this solar revolution might well be occurring in some contexts, the story of solar power in Africa is not so straightforward. Technologies and their application are ultimately shaped by a whole range of political economic dynamics, and therefore it is naïve to assume that newer 'green technologies' might somehow eschew the power dynamics of geopolitical energy production. Indeed, solar in Africa is increasingly not just seen as a panacea for African rural electricity (in)access dilemmas, but also as a solution to European energy supply woes. This has been exemplified by two recent proposals, one by the company Desertec in 2009, and another by TuNur in 2017, to set up a solar power megaproject in the Saharan Desert that would export electricity to Europe. Thus, facilitated by the green energy revolution, a European neo-colonial gaze is being fixated on the African Saharan Sun as a potential

commodity to abstract into Europe's energy market. Building on recent 'energy justice' academic literature, I explore the socio-political dimensions of these European Saharan Sun megaproject dreams, asking who will be the winners and who will be losers when 'big solar' comes to Africa?

Government and Renewable Energy Industry Leadership in Energy Transition – A Comparative Study between Australia and Taiwan *Yu-Chieh Lin, School of Communication, Faculty of Arts and Social Sciences, University of Technology Sydney*

This paper studies the relationship between the government and (the corporate) renewable business sector and its impact on energy transition in Australia and Taiwan. In 2015, Conference of the Parties (COP) organised by the United Nations Framework Convention for Climate Change (UNFCCC), carbon emissions reduction targets had been set out by country representatives in climate negotiations in Paris. Transforming resources into biomass and renewable energy through the development of innovation and technology has growing significance for countries including Australia and Taiwan as a major mechanism to reach their Intended Nationally Determined Contributions (INDCs). In Australia, developing renewable energy in a coal-exporting reliant and market based economy becomes a left and right wing political debate. Griffiths (2007:420) suggests the inherent policy development risks is embedded in high plurality between different government levels and influence between interest groups. This policy vacuum potentially hinders innovation and energy investments. On the contrary, Taiwan's strong corporatist social market popularises links between businesses and government, it also means the country's renewable policy direction is prone to changes in time of a shift of political power. In the two cases, it not only shows the important role political dynamics plays in renewable energy transition, as Patashinik (2008:3) have argued, a supportive institutional environment also promotes the likelihood that those renewable energy policies will endure. By comparing the two fundamentally different countries in normative and socio-political contexts, this paper draws upon the themes and contributes to existing research for addressing challenges of renewable energy policy deployment and energy transition.

Markets in the politics of renewable technologies *Daniel Breslau, Virginia Tech*

This paper identifies a paradox of energy liberalization and the promotion of renewable technologies. While proponents of market-based decarbonization argue that strong incentives can be built into markets, which will therefore guide the transition to renewables most efficiently, markets rule out the most effective political pathways for achieving pro-renewable policies. Support for renewables has been most effective where coalitions have been built among environmentalists, labor, and local politicians, linking renewable energy projects to jobs and economic development. Such coalitions form by defining renewable technologies as local or regional modernization projects. The renewable technology becomes a totem of these red-green developmentalist coalitions. But because such coalitions are realized through out-of-market subsidization of renewables, they are a threat to the logic

of the market, within which they are seen as distortions of price signals. The market systematically mobilizes a range of actors against the types of policies that can activate an effective developmentalist coalition. By reducing technologies to the financial logic of investment, and rejecting any other considerations, the world envisioned by the market logic excludes one of the most effective political pathways to decarbonization. In electricity markets in the US, this conflict assumes the form of a current dispute over state renewables policies and regional wholesale power markets. This paper examines this case, to analyze the conflict between the socio-technical universe of the market and that of the developmentalist coalition, and then to suggest ways of mediating this opposition.

Soil, climate and the promises of underground carbon *Celine Granjou, University Grenoble Alps*

The Paris Agreement reached at the COP 21 in 2015 signals the new centrality of carbon sinks, such as soils, as key means of offsetting anthropogenic greenhouse gas emissions and enabling a 'net' global climate balancing. My communication addresses the rising focus of climate science and policy on soil, including the interpellation and promotion of soil as enhanced carbon sink. Starting from the calculation that increasing the amount of carbon contained in soil by 0.4% per year would allow for offsetting annual anthropogenic greenhouse gas emissions at the planetary scale, the "4 per 1000: Soils for Food Security and Climate" action was launched by the French government and currently has more than 200 signatories internationally. By accounting for the genesis and on-going developments of the 4 per 1000 Initiative, my communication shall contribute to a critical understanding of the requalification of soil in terms of climatic 'services' provision and bio-geo-engineering potential. Drawing on a grounded investigation including interviews with soil and climate scientists and policy-makers, I shall suggest that current soil carbon sequestration projects rely on a rather restrictive vision of soil as a global stock of carbon that we could monitor, measure, model, and enhance, which tends to ignore the actual diversity of soils, the complexity of their agency and temporality (i.e. soil releasing as well as sequestering carbon) and major issues of soil conservation. It will unpack the risks associated to the development of a new promissory climatic regime relying on soil-based negative emission technologies.

Session Organizer:
Jonathan Paul Marshall, UTS
Chair:
Jonathan Paul Marshall, UTS

221. Animals and Technology Around the World, Past and Present 1
Papers for Open Panels/Animals and Technology Around the World, Past and Present
Open Panel
2:00 to 3:30 pm
ICC: E5.4

Across time and space, our relationships with nonhuman animals have involved a staggering assortment of technologies. In addition to the technologies we have developed to use with or against animals, animals also have been used *as* technologies, and they continue to serve as inspiration for even more. This panel welcomes papers on animals and technology, from reflective

essays and case studies to systematic overviews of past and present practices. We welcome papers focused on any cultural region or historical period of time and those reporting on obscure, esoteric, or failed technologies as well as common, persistent, and/or successful ones.

Participants:

Animals and Technology in the Zoo *Marcus Carter, The University of Sydney; Sarah Webber, The University of Melbourne*

Encounters between animals and humans are central to the objectives and practices of contemporary zoo experiences and zoos are making increasing use of digital technologies to make those encounters more engaging and educational, while ensuring animal well-being. Yet, many zoos show reluctance to introduce digital technologies into the zoo experience. Our research into the design of zoo-based technology has highlighted the ideological positions zoos have about the nature of encountering an animal, and the ways technology is thought to (re)mediates that encounter (Webber, Carter, Smith & Vetere, 2017; Carter, Webber & Sherwen, 2016). In this abstract, we will critically reflect on two digital technologies designed to support animal welfare goals within the context of the zoo, through which we seek to understand and explore the ways that digital technologies will intervene, facilitate mediate, and remediate human-animal encounters in the zoo context. The first case study will be the Kinecting with Orangutans project (Webber, Carter, Sherwen et al. 2017; http://www.socialnui.unimelb.edu.au/research/zoos/) which involved the design and development of an interactive projection inside the Orangutan enclosure at Melbourne Zoo. This technology aimed to provide animal enrichment, but has highlighted the opportunities – and risks – for human-animal interactions through shared digital spaces. The second case study will be the GirraffeTrack system (Dong, Carter et al. 2017) which employed thermal cameras and machine learning to track and locate giraffes within their enclosure 24 hours a day. This technology aimed to improve the quality of animal welfare monitoring, but has highlighted the risk of digital technologies interrupting the rich and intimate relationship between zoo-keepers and their animals. References Carter, M., Webber, S. & Sherwen, S. (2015) Naturalism and ACI: Augmenting Zoo Enclosures with Digital Technology. In Proceedings of the 2nd International Congress on Animal Computer Interaction (ACI '15), Iskandar, Malaysia. Dong, R, Carter, M., Smith, W., Joukhadar, Z., Sherwen, S., Smith, A. (2017) Supporting Animal Welfare with Automatic Tracking of Giraffes with Thermal Cameras. In Proc. the 29th Australian Computer Human Interaction Conference (ozCHI'17), ACM Press. Webber, S., Carter, M., Smith, W. & Vetere, F. (2016) Interactive Technology and Human-Animal Encounters at the Zoo. International Journal of Human-Computer Studies 98: 150-168 Webber, S., Carter, M., Sherwen, S., Smith, W., Joukhadar, Z., & Vetere, F. (2017) Kinecting with Orangutans: Zoo Visitors' Empathetic Responses to Animals' Use of Interactive Technology. In Proc. The 2017 ACM SIGCHI CHI CONFERENCE (Denver, Colorado), ACM Press, 6075-6088.

Designing for Animal-Human Interaction (AHIxD) *ANN JUDITH MORRISON, University of Southern Queensland;*

Sarah Webber, The University of Melbourne; Jane Turner, Queensland University of Technology

We ran a workshop "Animal Computer Interaction (ACI) & Designing for Animal Interaction (AXD)" at OZCHI 2017, and invited researchers and practitioners who work in some capacity with animals and want to expand their working methods to include learning more from the animals. More recently, a growing body of work focuses on both the reciprocal nature of our relationship with animals [1] as sentient beings in a designed world and as partner-users suffering the effects of our designing in the world [2]. We found that Animal Computer Interaction (ACI) systems have been mostly designed and evaluated driven by human-centered approaches [3]. However, there is a growing body of research and need for an animal-centered approach that would benefit both humans and animals. We envisage designing more usable interactive systems to that begin with working from the intelligence of the animal, in order to improve the quality of the overall system and learnt outcomes. We have begun to gather a body of researchers and practioners together to investigate and discuss their understandings, experiences, competencies and implementations for best practices for Animal Interaction Design. [1] Donna Jeanne Haraway. 2008. When species meet. {University of Minnesota Press} and {Bristol : University Presses Marketing [distributor]}, Minneapolis, Minn. Retrieved from http://www.loc.gov/catdir/enhancements/fy0732/2007029 022-d.html [2] Jessica L Cappadonna, Margot Brereton, David M Watson, and Paul Roe. 2016. Calls from the Wild: Engaging Citizen Scientist with Animal Sounds. In Proceedings of the 2016 ACM Conference Companion Publication on Designing Interactive Systems (DIS '16 Companion), 157–160. https://doi.org/10.1145/2908805.2909413 [3] C. Mancini. 2011. Animal-computer Interaction: A Manifesto. interactions 18, 4: 69–73. https://doi.org/10.1145/1978822.1978836

Matchmaker, Matchmaker: The Creation of Technology through Epistemic Partnerships with Assistance Dogs *Leah M McClimans, University of South Carolina, University College Cork*

Assistance dogs are working dogs trained to aid someone with a disability. In this paper I discuss the use of assistance dogs with autistic children and their families. I argue that assistance dogs are a type of technology, but that triggering this technology-"activating" it-requires the formation of an epistemic partnership between the dog and its handler. A dog, even a well-trained one, is just a dog until a partnership is formed with its human handler. This partnership is epistemic in character. The success of these partnerships is dependent on a range of social, cultural, environmental and idiosyncratic factors, not unlike the success of human-human partnerships. Assistance dog trainers are key elements in this technology because they serve as matchmakers when determining what dog will be partnered with what family. The act of matchmaking is always uncertain, and I discuss various techniques used by assistance dog trainers to mitigate this uncertainty. As part of a Marie Curie ASSISTID fellowship to address the ethical and epistemic questions regarding the construction of evidence for assistive technologies, I observed assistance dog trainers "matchmaking". In this paper, I will discuss my

observations and interviews with dog trainers from Irish Guide Dogs to illustrate the how in this case dog-as-technology is contingent on the formation of a successful epistemic partnership.

Mosquitoes as technologies for airborne diseases control *Claudia Santos Turco, HCTE-UFRJ / FIOCRUZ; Eduardo Nazareth Paiva, EDUARDO NAZARETH PAIVA*
The Aedes aegypti mosquito has lived in Brazil since colonial times and it enables the circulation of viruses that affect human health, such as dengue, Zika and chikungunya. Over the years, various vector population control practices have been employed: mechanical, biological and chemical techniques. These techniques traditionally place vector control, monitoring and surveillance as their central issue. This work presents an analysis on recent controversies over techniques used in the control of Aedes aegypti, which gained a greater dimension during the Zika outbreak in Brazil (2015/2016) and particularly during the Olympic and Paralympic Games in the city of Rio de Janeiro. It was a moment of reappraisal of strategies and technologies available, nationally and internationally, which allowed open debates on old and new technologies and influenced the research agenda internationally and in Brazilian institutes, such as Oswaldo Cruz Foundation. Special attention will be given to the controversies that appeared related to the use of two new technologies in Brazil, both products of biotechnoscience: an OGM-mosquito and a mosquito contaminated with a bacteria (which can be called a biological control from within). These new technologies changed the relationship human-mosquito-microorganism as they use mosquitoes (and bacteria) as a technology, transforming them into would-be allies. The analysis will follow and observe these new techniques, using a sociotechnical approach inspired by the constructivist ideas and local, situated, anthropophagic knowledges. It will comprehend how, locally, these techniques incorporate elements of the biotechnoscience and environmental discourses as well as the bioethical questions they arise.

On Dog-Technologies and Models: Canine Subjects and Experimental Objects *Brad Bolman, Harvard University*
This paper offers an overview of writing over the last two decades on dogs as experimental animals and model organisms. It asks whether studies of "model organisms" have been sufficiently attentive to the role and place of dogs as and in biotechnologies, but also whether work that treats dogs simply as technologies for experiment underplays the complex relationships of affect and pleasure between researchers and their scientific subjects. To do so, it draws upon case studies of smoking and aging experiments.

Session Organizers:
Christena Nippert-Eng, Indiana University
Patrick C. Shih, Indiana University Bloomington
Chair:
Christena Nippert-Eng, Indiana University

222. Regimes of Knowledge Production
Closed Panels
Traditional (Closed) Panel
2:00 to 3:30 pm
ICC: E5.5
The purpose of this workshop is to explore the conceptual and

methodological potential of the notion of 'epistemic regimes', which has surfaced in the last two decades. The idea underlying this notion – that there are configurations of mutually stabilizing epistemic practices and social structures – is essential for our understanding and comparative study of interactions between individual, group, and community levels of knowledge production. It has a long tradition in STS, which usually counts Fleck's 'thought collective' as precursor, starts of with Kuhn's exploration of paradigms as structuring scientific work, and moves via concepts like 'invisible college' (Crane) and 'scientific specialty' (Chubin) to Whitley's systematic account of epistemic and social structures and Knorr-Cetina's comparison of 'epistemic cultures'. Recent empirical work from a historical perspective identified a disciplinary (Heilbron) and an interdisciplinary regime (Marcovich and Shinn), as well as a transverse regime of research technology (Joerges and Shinn). The session will draw on this line of thinking in STS and explore the correspondence between research practices and social structures of scientific communities. An analytical approach to studying epistemic regimes could re-balance the investigative efforts of science studies after a phase of preoccupation with individual and local knowledge production processes. The session will discuss the potential of the idea of 'epistemic regimes' for two important enterprises, namely understanding the dynamics of knowledge production and comparing knowledge production processes.
Participants:

How do specialties reproduce their epistemic regimes? *Jochen Glaser, TU Berlin; Grit Laudel, TU Berlin; Chris Grieser, TU Berlin; Uli Meyer, TU Munich*
We consider epistemic regimes as systems of distinct epistemic practices that are maintained by a specific social structure, and ask how the stability of these arrangements can be explained. We compare four scientific specialties – experimental atomic and molecular optics, plant biology, early modern history, and mechanical engineering – in order to identify the mechanisms that reproduce the arrangements of epistemic practices and social structures. Our analysis extends Whitley's approach by comparing specialties' epistemic practices, the ways in which the interdependence of researchers is mediated by theory, methods, and empirical objects, the internal authority distribution in specialties and their external authority sharing through their embeddedness in society. We identify two interlinked processes through which epistemic regimes are reproduced. First, specialties create particular epistemic careers in which researchers are socialised and trained. We will demonstrate that each epistemic regime is linked to a particular career pattern in which highly standardised organisational positions are arranged in sequences that support field-specific ways of learning and gaining independence. Second, specialties enable, promote and select research programmes that reproduce their epistemic practices. The two major mechanisms through which research programmes are reproduced are the control of external funding and recruitment. In the case of the mechanical engineering, control over the reproduction of epistemic practices is shared with external actors, namely the industrial companies that form the dominant audiences for academic engineers.

The diversity of research technologies: A comparative framework *Eric Lettkemann, Technische Universität Berlin*
It is the merit of Terry Shinn to have described an epistemic regime that operates in the shadows of

disciplinary knowledge production. This is the "transverse regime" of producing and diffusing research technologies, designed to meet the requirements of a wide range of academic and industrial audiences. The transverse regime described by Shinn is also the object of my reflections, but I propose to take a new perspective on research technologies. I bring forward the argument that it is a worthwhile strategy to look for differences occurring within the transverse regime. For example, research technologies vary in the extent to which the knowledge, necessary to operate the device, becomes encapsulated in a black-box. In some cases, audiences have a strong influence on technological developments and data interpretation, in other cases they do not. There is a lack of an analytical framework that would permit systematic comparisons to be made between the social and epistemic properties of various research technologies. It is the purpose of my contribution to introduce such a framework and to discuss some of its consequences for further research. On the basis of a re-analysis of existing case studies, I have identified six dimensions in which research technologies show variations. Three dimensions are of epistemic nature, while the other variations concern the social structure of knowledge production. The re-analysis is motivated by the strong expectation that the features of the different dimensions do not vary independently and that only certain combinations occur.

Similar epistemic practices and diverse social structure lead to different social shapings of "functional equivalent" software programmes *Daniel Guagnin, TU Berlin*

GNU/Linux Distributions take the source code of various other ("upstream") projects and build a complete operating system. For the organisation of the code production and the maintenance of updates and improvements they have different organisational structures. Remarkably, the selection of the software adopted, the preconfiguration of standard system settings and the shaping of distribution specific tools for installation and configuration of the system have a political dimension. The decisions made for the structure of the system are taken by individuals or groups which are legitimized through specific organisational rules but also through the informal influence of individuals with specialist reputation. The social structures of the community itself and the ways in which decisions are made and legitimized are part of political debate within the communities, even if politics is generally neglected due to the faith in "rough consensus and running code". The comparison of different GNU/Linux distribution communities shows how epistemic regimes of software production can substantially differ in their norms, rules and practices despite their common epistemic practices of coding, bug reporting and documentation. The three cases presented reflect the bureacratization of open source production through the installment of a proper (epistemic) regime (case 1: debian) to avoid the capriciousness of a self-assigned elite, the opening of the community to non-experts (case 2: ubuntu) and the overt rejection of lay users to keep a productive vanguard elite (case 3: arch). It can be shown how the outcome of the knowledge production mirrors the normative foundations of the epistemic regimes.

Session Organizer:
Jochen Glaser, TU Berlin

223. The Politics of Science and Technology in International Development Open Panel 2
Papers for Open Panels/The Politics of Science and Technology in International Development
Open Panel
2:00 to 3:30 pm
ICC: E5.6
Participants:

Data Wars *Manjari Mahajan, New School University*

This paper discusses a new data ecology emerging in the field of international development and how it is becoming the context for novel kinds of knowledge production and interventions about poverty. Specifically, the paper focuses on how this new data ecology is displacing an older world of statistics in the context of the Sustainable Development Goals. Statistics has long been the language of the modern state and of development enterprises, a crucial tool for representation, governance, and accountability. Historically, it has been through statistics that national populations and their economies and societies have been represented, be it through demographics, epidemiology, or economics. This world of statistics, dominated by state governments and inter-governmental agencies, is increasingly being reconfigured with the entry of an array of new data actors including for-profit corporations and philanthropies. These new actors bring with them a cacophony of novel data technologies and practices that are distinct from older statistical tools. The emerging data actors herald epistemological and political shifts in the field of development: they generate new kinds of knowledge about how to conceptualize and measure poverty; they also represent a changing role for states vis-à-vis private actors, and new understandings of intervention and accountability.

Making Global Facts: Scaling, Standardization, and Erasure in International Development Metrics *Erin V Moore, Northwestern University*

This paper examines the standardizing functions of international development research. Critical development studies scholars (e.g. Adams, Escobar, Ferguson, Merry) have long argued that in order to produce the knowledge of global-scale problems, development metrics must disambiguate their findings from particular political and social contexts and in so doing delineate their zones of intervention. This paper expands these insights into contemporary "participatory" research initiatives that fetishize the inclusion of beneficiaries' "voice." It follows the production of one metric in particular that became a major rallying point for the growing movement in international development dedicated to investing in adolescent girls as the solution to global poverty: "In Kampala, 80% of girls do not feel safe." The 80% statistic represents the findings of a research study designed and financed by one major multinational development NGO's international headquarters in Canada and carried out by the agency's subsidiary office in Uganda. Tracing the study as data were reported to three different NGO offices – the Kampala city office, the Ugandan national office, and the international headquarters in Toronto – reveals that in the process of scaling and standardizing young women's reported answers to represent a "global" need for gender-sensitive urban safety initiatives, the report's authors inadvertently erased young women's actual

demands for economic and health services. Consequently, this paper argues that the standardization required for development metrics to circulate transnationally ultimately erases the very "voices" participatory research intends to capture.

Mapping Land and Resources in Myanmar: New Data Infrastructures for New Development? *Jenny Elaine Goldstein, Cornell University; Hilary Faxon, Dept of Development Sociology, Cornell University*

Once a military-ruled black box of internet connectivity, Myanmar opened to international investment in 2010, formerly transitioned to democracy in 2014, and has since undergone a transformation in digital infrastructure. Prior to 2013, there was little to no internet and mobile phone access across the country but as of 2017, over two-thirds of households own at least one mobile phone and 80% of the country has access to internet or 3G networks. Lacking much of the brick-and-mortar infrastructure traditionally assumed to be the foundation of economic development, some government officials, international consultants, and NGOs are advocating for Myanmar to "leapfrog" over tangible infrastructure in the education, health, and agricultural sectors and instead adopt digital infrastructure as the basis for development. Yet there are tensions between global data infrastructure that seeks to make open data and data transparency ubiquitous and a newly democratic country with still-entrenched military norms that advocated secrecy for many decades, particularly over resource and land control—the backbone of Myanmar's development strategy. Drawing on qualitative research in Yangon, we assess how new digital infrastructures in land and resource mapping are being implemented as part of an effort to liberalize Myanmar's political and economic institutions. We argue that, despite the rapid introduction of new digital infrastructures that presume increased accuracy and transparency of data used by the resource-based development sector, such infrastructure does not necessarily alter the power structures that have left the majority of Myanmar's population out of traditional development pathways in the past.

The Archipelago of Care: Connected Isolation in the Pan-African e-Network *Vincent Duclos, Drexel University Center for Science, Technology & Society*

In September 2004, former president of India Abdul Kalam proposed to connect Africa with India through a network aimed at providing healthcare services. Five years later, the Pan-African e-Network (PAN) was launched. PAN is digital health network connecting doctors and patients across the African continent with tertiary care hospitals in India. Involving a massive network infrastructure, this South-South development project connects hospitals in over thirty countries. Put simply, PAN provides an integrated solution aimed at caring for patients, at a distance. To do so, it assembles a large pool of medical expertise, seeking to reconfigure the global distribution of care. Drawing upon ethnographic research, this paper examines how PAN contributes to the emergence of clinical spaces. It documents the crafting of global yet enclosed, "interior" spaces, in which patients become the object of remote intervention. The paper shows how, from its morphology to its everyday operations, PAN challenges a common "network aesthetic" – the network as a metaphor for seamless

circulation. PAN does not so much compress space as it gives it form, which implies an arrangement of elements, an ordering, or mediation of one's relation to the world: its connectivity is inseparable from technical and political processes of insulation. Ultimately, this paper explores the affordances to which PAN lays claim, and hw they articulate portability and situatedness, circulation and containment, imagined presence and intractable remoteness.

Session Organizer:
Shobita Parthasarathy, University of Michigan

224. Time-Scapes of Toxicity (1): Making Boundaries
Papers for Open Panels/Time-spaces of toxicity
Open Panel
2:00 to 3:30 pm
ICC: E5.7

How does time play out in toxicity? While ideas of "the Anthropocene" and "slow disaster" urge consideration of hazards along much longer timeframes, the multiplicity and simultaneity of temporal scales—of humans, natures, and materials such as plastics, pesticides, or radiation—complicate the ways actors and researchers comprehend time within and across polluted sites. Time-scapes connect with land- and socio-scapes. On the one hand, acknowledgment of toxicity develops at different times in different regions, and industries strategically shift extraction and manufacturing to navigate costs and regulation. On the other hand, human actions bring about new openings and closures to toxicity – for instance, when actors reframe asbestos as a present-day environmental hazard, rather than occupational hazard "of the past" to mobilize attention and intervention. We welcome papers exploring questions such as: Where in time do actors locate risks, and what work does that do? Where are places located in relation to time-scapes of toxins? In what ways do actors make sense of temporal scales in polluted sites, and work to open and close problems of toxicity? How do temporal boundaries relate to efforts to manage hazards and enact safety? How does temporal locating of risk, shift public priorities or felt experiences of being "at risk" or safe? How do actors and could researchers comprehend a longue durée of hazards? By asking these questions, this panel contributes to the understanding of transnationality of knowledge production, technological inventions and usages, and regulation and activism about hazards – through thinking across temporal and spatial boundaries.

Participants:

Athwart a Mercurial Ocean: Transnational and Transcorporeal Flows of Methylmercury *Elspeth Probyn, Gender & Cultural Studies, University of Sydney*

Humans have dumped "stuff" in oceans for a long time, and in a particularly concentrated way since the global north's Industrial Revolution, the effects of which we now note as evidence of the Anthropocene – or the Anthropocean. Here I trace the enactment of a mercurial ocean through mercury as it is taken up and transported by atmospheric and oceanic currents from plumes produced in artisanal mines in Asia, and transformed into methylmercury as it engages with water and bacteria. It becomes an agent of trans-movement: it enters into the food chain and eventuates in the diets of certain populations, especially those in Nordic countries, with toxic effects into future generations. This, I argue, produces a particular understanding of the trans-ocean, one with temporal and spatial multiplicity that distinctively rearranges the global north-south. For

instance, the flow of mercury is gendered and racialized with women workers in Indonesia being primarily affected while women in the north are the recipients of methylmercury in the form of toxic fish. I engage with scientific research on mercury flows and methylmercury biogeochemical cycling, and draw on the work of Annemarie Mol on the body multiple, feminist STS research into epigenetics (Mansfield, Guthman, Landecker), and feminist environmental posthumanism (Alaimo, Neimanis). My argument seeks to disturb the singular and othered ocean in order to make way for the ocean multiple – a conception of the different forms of the oceanic produced through the athwart or trans admixtures of the more-than-human (Helmreich, Probyn).

Chip, Body, Earth: Toxic Temporalities of Intel Processor Production *Luke Munn, Institute for Culture & Society, Western Sydney University*

The early production of Intel processors in Silicon Valley heavily relied upon an array of toxic chemicals. Working intimately with these chemicals, workers internalized burns and bleaching as well as long-term injuries to organs. At the same time, these chemicals seeped into the earth below production facilities, contaminating the soil and water tables. Processor production thus enfolds three distinct temporalities of chip, body and earth, bringing together times of technicity, labor and nature. Chip time is a time of clock cycles, executing thousands of instructions per second. Yet contrary to other theorizations, time doesn't become elided into 'real-time', but is underpinned strongly by the uniformity and regularity of 'clock-time'. Body time plays out over decades within the predominantly female and immigrant work force of semiconductor manufacture. A 'time lag' occurs in which toxicity unfolds internally in the slow decay of the corporeal. Earth time here entails the designation of the factory site as a SuperFund site by the Environmental Protection Agency, a toxicity that will take 300 years to cleanup. Processor production thus brings these three forms of temporality together. Yet time is never simply 'left alone', but rather compressed and expanded in significant ways. Indeed, the difference between time scales becomes a kind of 'time arbitrage', forming a hinge for the accumulation of capital, even while degrading skins and soils.

Contaminated Insides? Capturing the histories and toxicities of DDT in Africa *Rene Umlauf, Martin-Luther University Halle*

In 2006 the WHO announced the reintroduction of the insecticide DDT (Dichloro- Diphenyl-Trichloroethane) as a preventive technology to globally control malaria. As part of a public health technique called Indoor Residual Spraying (IRS), DDT kills mosquitos inside habitations. In 2008 the Government of Uganda was sued by a local NGO claiming the overall risk to human health and the environment would be too high. This was preceded by the experimental deployment of DDT in two northern districts as a result of which thousands of organic cotton farmers lost their contracts with the trading companies. In order to examine the conflicts between Global Health and Organic Farming the paper traces the historical detours as well as inherited histories of DDT (non-)use around the world. I will show how the conflict of DDT use for malaria control was sparked of by the need to separate the (environmental) toxicity of the chemical from its public health benefits. Secondly, taking the local practice of

storing cotton indoors as an ethnographic entry point the paper analyzes how the deployment of DDT/IRS transforms habitations into a bio-political space. The paper discusses the contingencies and difficulties that determine the inscription of healthy or hazardous effects into the deployment of the chemical. It is argued that the question whether DDT is enacted as public-health tool or a potentially hazardous pesticide indoors is not so much decided by compliance with WHO guidelines but rather by legal action of multinational companies, global regulatory conventions, and western consumption patterns.

Make it Safe, Make it Past *Britt Dahlberg, Science History Institute*

Asbestos in the United States is the stuff of daytime television commercials: lawyers for class action mesothelioma cases reach out to older retired workers who may have worked in "past" industries and settings like shipyards with high exposures to the now known carcinogen. But asbestos is still quite present. In the late industrial town, Ambler, Pennsylvania, during my fieldwork from 2009-2014, residents, activists, and scientists gathered to contend with large amounts of asbestos containing material located in dump sites and throughout the area, remnants of local manufacturing. Activists talked of the need to "make asbestos a problem again" in order to make the area safe. Government scientists responded by working to differentiate occupational exposure pathways of the past, from potential environmental pathways of the present or future. Both groups played the same temporal boundary-work game: in an effort to define and enact "safety," and set in motion new development, they worked to locate toxicity in a sealed apart category of the past, separate from present and future. In contrast, I highlight the theorizing done by long-term residents who pushed against this assumption, noting instead a 'present past.' I argue that the scientific and activist efforts to locate risk temporally were part of the techniques of enacting safety, and highlight the broader stakes – and who was included and excluded from these imagined and enacted 'safe futures'- in the process.

Segmenting Time, Escaping Ecology *Yoonjung Lee, KAIST; Seung Hee Cho, Korea Advanced Institute of Science and Technology (KAIST)*

In academic and business discussions, risk is frequently associated with the future. However, in the context of work-related illness claims, risk often emerges in retrospect. It is a conceptual lens through which one understands the past alongside the present. This paper examines contention over the temporal aspects of injury, based on ethnographic research at an occupational safety and health advocacy group in California. We focus on a high-profile lawsuit against a large US company, filed by some of its former employees who attributed their illnesses, such as cancers, to toxic chemicals in their work environment. A special attention is paid to a key defense theme developed by attorneys for the company: "real time" versus "litigation time." We analyze how the defendant's insistence on the separation of the past from the present undermined the sick workers' right (and authority) to speak about their illnesses. We also discuss how this segmentation of time was combined with the defendant's effort to detach the plaintiffs' bodies from

their work environment. We suggest that these temporal and spatial separations dispelled the notion of industrial ecology and objectified workers' injuries.

Session Organizers:
Britt Dahlberg, Science History Institute
Yeonsil Kang, The Catholic University of Korea
Chair:
Yeonsil Kang, The Catholic University of Korea

225. Digital Sexualities, Biomedical Practice, and Queer Realities: Activism & Sex Robots
Papers for Open Panels/Digital sexualities, biomedical practice, and queer realities
Open Panel
2:00 to 3:30 pm
ICC: E5.8
Participants:

Queering The Promissory Futures Of Intersex: Or, Has Intersex Activism Been Queer STS All Along? *David Andrew Griffiths, Surrey*

Since the 1990s, intersex individuals and groups have been challenging medical discourses and practices related to individuals born with sex characteristics that do not fit neatly into binary constructions of male or female. Intersex activism and scholarship has, for the best part of three decades, been doing both queer work, and STS work. For example, work on intersex has long been aware of the challenge to heteronormativity that intersex bodies pose, and that so-called "normalising" surgeries are structured by norms of compulsory heterosexuality. Intersex activism and scholarship also involves a critique of biomedical science, challenging the practice of ongoing non-consensual cosmetic surgery on infants, as well as the workings of biomedical power through, for example, the language of contemporary classification systems such as DSD (disorders of sex development). In this paper I will draw on my research into the recent history of intersex in the UK. I will examine how past boundary-making practices around intersex, trans and homosexuality can illuminate contemporary tensions, including the question of if, how and when to include the I in LGBTQI+, and what responsibilities this confers. Employing the tools of queer studies and STS, I will also question how promissory futures – either biomedical and increasingly genetic, or biosocial and mediated through online networks – might be amenable to critique, without fundamentally destabilizing the aims and practices of intersex individuals and groups. Sketching a strategic intersex futurity, I will suggest that intersex activism and scholarship may have been Queer STS all along.

Reconfiguration of Sex Robots/Reconfiguration of Sexual Practices *Tessa Leach, University of Melbourne*

This paper discusses the power of emerging sexual, communicative and companion robots to facilitate the formation of new communities, particularly those based on unintended uses or configurations of robots. Robots that mimic human social interaction defy categorisation, an issue that is exacerbated by their current inaccessibility to typical consumers. Obviously anthropomorphic robots blur the policed line between human and nonhuman, but as they emerge from science fiction texts and become a part of our lives other transgressive qualities are becoming apparent. Framing a robot in terms of health, entertainment or other purposes prompts expectations for

the way that a robot "should" be used by a consumer. The appearance and branded content of robots combines with the social, cultural and religious milieu to suggest certain affordances to consumers. Yet consumer uses of robots may consciously or unconsciously avoid the intended purpose of these robots causing conflict between users, manufacturers and maintainers of the social status quo. The uses of social robots for fetishistic/kinky play is made possible by their nonhuman status and their potential for customisation. The question of consent, both to sex and to the radical reconfiguration of robot bodies by consumers is addressed. Sexual, communicative and companion robots are born of fantasy, and early adopters of new sexual technologies have a unique opportunity to create new communities based upon the enactment of those fantasies. This paper will discuss the current and future potential of social robots to transgress human-imposed boundaries, which is permitted by their more nonhuman aspects.

Sex Technology: The Turn to Sexuality in the Age of Robots *Terence H. W. Shih, St. John's University, Taiwan*

This paper focuses on the concept of emotion to explore the changing ideas of sexual love from humans to robots. With the rise of robotic technology and bionics, the sex object is moving towards robots. A sex machine is no longer a metaphor; instead, it inspires inventors to create more pleasure and 'well-being' for men and women alike. The birth of sex robots indeed challenges moral, religious and gender values. Approaching queer theory and textual reading, the paper will conceptualise the materiality of love through brief discussions of mythology, sci-fi and real-life robots. In history, female bodies were playfully regarded as sex machines or sex slaves. Hopefully, sexuality can be transformed into clean and safe behaviour in the future. While controversial and seemingly anti-ethical, this issue of robot fetishism helps to face 'humanity' (esp. genetic lust), reconstruct sexual ideology, and rethink sexual morality.

Viral Transmission: Affect, Disidentification and the Curation of AIDS Activist Archives on Tumblr *Marika Cifor, Indiana University - Bloomington*

Digital media creates new economies where archival records documenting AIDS activism in the U.S. during the 1980s and 1990s frequently circulate and are appropriated in ways divorced from the gendered, racialized, political, and affective context of their production. These images are frequently disseminated on social media in ways that shape and are shaped by platforms' affordances as well as political and cultural values. This paper follows a set of 1988 images, including a photograph of ACT UP dying-in at the Food and Drug Administration, agitprop collective Gran Fury's "Read My Lips," and a letter by artist Félix González-Torres' to lover Ross Laycock, as they emerge from archives into and within Tumblr. On Tumblr, a social media and microblogging platform, users become curators. The frequent blogging, reblogging, and liking of AIDS images without any contextualizing reference has been framed as depoliticizing young queer users, who embrace the aesthetics of the past rather than the politics of AIDS' present. However, following curatorial acts on Tumblr presents a more complicated understanding. Tumblr is an important site of creative production and fandom for its users, largely youthful and often identified with LGBTQ

and/or communities of color. Tumblr's design affords the formation of counterpublic spaces for media literacy, identity formation, and political awareness. Its users' appropriation and accumulation of iconic AIDS images I argue is marked by disidentification, where bloggers are situating themselves both within and against dominant white, gay male discourses through which queer people called to identify with AIDS and its activism.

Session Organizers:

Stephen Molldrem, The University of Michigan
Jean Hardy, School of Information at University of Michigan
Roderic Crooks, UCLA Department of Information Studies

226. Crafting Common Worlding Pedagogies
Closed Panels
Traditional (Closed) Panel
2:00 to 3:30 pm
ICC: E5.9

The Common Worlds Research Collective is a transnational and transdisciplinary network of feminist scholars. We undertake research with children and educators and share a commitment to recuperative and decolonising pedagogies in ecologically precarious times. Feminist STS perspectives are integral to our common worlding pedagogical inquiries, as we work to displace individualistic approaches to children's learning rooted in anthropocentric developmental science. Extending Latour's (2004) articulation of "common worlds", we reconfigure pedagogy as a collective practice of 'learning with' others in our worlds, and of mobilizing our accountabilities to entangled multispecies, material, and social justice concerns within the Anthropocene. We contest epistemological hierarchies that privilege Euro-Western narratives, drawing inspiration from feminist STS scholars who make visible constitutive alliances between scientific analysis and colonialism (Hamilton, Subramaniam, & Willey, 2017; TallBear, 2013). Learning from Indigenous and women of colour scientists who unsettle the disciplinary exclusions of scientific knowledge (Prescod-Weinstein, 2017; Roy, 2016; Todd, 2016), our pedagogical intentions defy foundational epistemological divides within education that perpetuate anti-blackness, settler colonialism, and human exceptionalism. Our speculative, situated, and slow pedagogies are motivated by STS scholars who urge us to find new ways reshaping our common worlds together (Haraway, 2016; Puig de la Bellacasa, 2017; Stengers, 2005). Through five papers grounded in research from Canada, Ecuador, the United States, and Australia, this panel illustrates how feminist STS theorisations have informed locally-responsive pedagogies and contributed to deepening the transdisciplinary STS project. We showcase how innovative STS-education partnerships transform relationships with metabolisms, waste, water, gender, and rabbits across both fields.

Participants:

Waste pedagogies in Andean common worlds *Veronica Pacini-Ketchabaw, Western University*

Young children around the world inherit a waste crisis. Yet, this global crisis is differentially experienced in the global south where solid waste management practices are precarious, trash sticks to neocolonial movements of human and nonhuman bodies across geopolitical borders, and waste intersects with local elements and forces that challenge human-nonhuman separations. In this presentation, drawing on ethnographic research in Ecuador, I weave feminist environmental humanities and science technology studies (de la Cadena, 2015; Hird, 2012; Neimanis et al., 2017) with a common world

childhoods framework (Taylor, 2013) to explore young children's entangled lives with plastics in an Andean village. I bring together the migration of human bodies from the Ecuadorean Andes to North American cities, plastics' participation in global assemblages and in Andean politics, and local onto-epistemologies to develop situated waste pedagogies. These waste pedagogies reconfigure ineffective, even detrimental, waste management strategies such as the Rs (reduce, reuse, recycle) and engage 'productive uncertainty' (Ong, 2016). Such reconfiguration emphasizes the different registers of uncertainty that are at play in Andean waste futures: from plastics' material transformation, to the uncertainties of the golden age of recycling, to the 'known unknowns' that education confronts in attempts to provide short and long term answers to the Anthropocene.

Queer worlding pedagogies with tree-girl-dog assemblages
Mindy Blaise, Victoria University

In light of feminist science and technology studies' (FSTS) critiques of the colonizing project of science, this presentation shows the potentialities of queer FSTS (Mortimer-Sandilands and Erickson, 2010) for unsettling binary and settler logics about young children's gender subjectivity and relations with place. A queer ecologies framework is used to trouble human exceptionalism, the nature/culture binary, and norms. Heteronormativity is highlighted and understandings of children's gender subjectivity are expanded by extending it to include human child and non-human assemblages. This is a significant shift towards recognizing that nature (trees, sunshine, moisture, wind) plays an important role enabling and shaping subjectivity and social relations (Schnabel, Breitwieser, & Hawbaker 2016). Drawing from an ongoing multispecies ethnography of children's everyday encounters with Eucalyptus trees, located on the traditional lands of the Kulin Nation, in Melbourne, Australia, I present queer assemblages of tree-girl-dog relations. These queer assemblages complicate the human child and nature relationship because they dissolve and mess-up all kinds of overlapping dichotomies (i.e., nature/culture, human/animal, adult/child, girl/boy, subject/object). In doing so, human gender subjectivity can be reconsidered in terms of relations and connections across all living and non-living entities and as a continual process of negotiation, rather than autonomous and biologically determined. While researching with trees, dogs, and girls I show how queer worlding pedagogies responds to these queer assemblages by being open-ended, entangled, and with the more-than-human.

Learning with wild rabbits: Troubling the divides of settler colonialism *Affrica Taylor, University of Canberra*

In Australia, the European wild rabbit is listed as a primary 'invasive species' and has been long vilified for causing environmental damage on a continental scale. Since the mid 1950s, the release of targeted viruses has significantly reduced wild rabbit numbers, but there are always local pockets of resurgence. One of these is on the ANU campus, where wild rabbits currently abound. This is also where I am involved in a common worlds multispecies ethnographic research project called 'Walking with Wildlife in Wild Weather Times', along with a colleague and group of preschool children. In this presentation, I recount a series of the children's pedagogical encounters with wild rabbits during their

regular walks in a grassy woodlands area on campus, and down the road at 'The Rabbits' exhibition at the National Museum of Australia. Situating these encounters within the messy legacies of settler colonialism - including trashed environments, as well as epistemological divides and dissociative bifurcations - I detail how the children learn with these wild rabbits about their fraught and entangled inheritance. I describe how they grapple with their affinity for these 'invasive' rabbits, rather than distancing themselves from them. In reference to Donna Haraway's (2016) call for us to learn how to inherit by 'staying with the trouble' and Deborah Bird Rose's (2004) call for a 'decolonising ethic' that resists separation and seeks connection, I reflect upon how these children's modes of learning with rabbits might provide a template for recuperative common world pedagogies on settler colonised lands.

Session Organizer:
   Nicole Land, University of Victoria

227. STS in Practice: Activism, Algorithms and Accountability
Single Paper Submission
Special Event
4:00 to 5:30 pm
ICC: C2.3
Join us in one of the highlights of 4S – a conversation between data scholar Joan Donovan and Director of the Autonomy, Agency & Assurance (3A) Institute Genevieve Bell. Joan Donovan is the Media Manipulation Research Lead at Data & Society Research Institute. The Media Manipulation Initiative (MMI) examines how different groups use the participatory culture of the internet to turn the strengths of a free society into vulnerabilities, ultimately threatening expressive freedoms and civil rights. Through empirical research MMI identifies the unintended consequences of socio-technical systems and track attempts to locate and address threats, with an eye towards increasing organizational capacity across fields, so that action can be taken as problems emerge. Genevieve Bell is the Director of the 3A Institute, Florence Violet McKenzie Chair, and a Distinguished Professor at the Australian National University (ANU) as well as a Vice President and Senior Fellow at Intel Corporation. Bell is a cultural anthropologist, technologist and futurist best known for her work at the intersection of cultural practice and technology development. She joined the ANU's College of Engineering and Computer Science in February 2017, after having spent the past 18 years in Silicon Valley helping guide Intel's product development by developing the company's social science and design research capabilities.

Session Organizers:
   Joan Donovan, Data And Society
   Kim Fortun, University of California Irvine

228. Investigating drug transformations through an ontopolitical lens
Closed Panels
Traditional (Closed) Panel
4:00 to 5:30 pm
ICC: E3.2
Drugs produce transformations for people who consume, govern and research them. At the same they time are also transformed. The dynamic character of drugs – the heterogeneous activities they give rise to and support, and the multiple things they 'do' and become – has traditionally received relatively little attention in research and governance. Rather than attending to the ways drugs shape and are shaped by practice, researchers and policy makers have approached them as stable chemical entities with reliable and

clearly identifiable effects. Recently, researchers have begun drawing on insights from Science and Technology Studies (STS) to attend to the multiple emergence of drugs, and productively engage with them as relationally co-produced forces with effects formed within heterogeneous networks of actors. This requires researchers to rethink established methods of studying drugs and work with the understanding that research practices actively transform, rather than merely describe, particular realities of drug consumption. Much of this innovation has emerged from Australia, pointing to the significance of STS for alcohol and other drug research in the Asia-Pacific region. This panel will present work associated with Curtin University's Social Studies of Addiction Concepts research program, exploring how STS-inspired performative accounts have shaped our research and informed new ways of responding to alcohol and other drug issues. Specifically, we investigate what might be called an 'ontopolitically-oriented' approach to alcohol and other drug consumption, considering the ways it reformulates conventions of researching and governing drugs, and its implications for alcohol and other drug issues specifically relevant to Australia but with transnational significance.

Participants:
   Doing ontopolitically-oriented research: Investigating and enacting lives of substance *Suzanne Fraser, National Drug Research Institute, Curtin University*
      Addiction has long attracted intense scholarly, policy and media attention. Despite this, little systematically collected knowledge exists on the experiences of people who consider themselves affected by it. This presentation will discuss a research project that set out to generate new knowledge on these lived experiences, and in doing so, to produce a web site (livesofsubstance.org) presenting accounts of such experiences in video, audio and text format. The aim of this presentation will not be to report on these findings or on the website per se, however. Instead it will examine the project from the point of view of its ontological politics. As I will argue, the project and its outcomes were fundamentally inspired by the insight that research not only explores and describes realities, it actively constitutes the realities it explores, playing a direct role in reconstituting realities through its conduct, outcomes and communications. I adopt the term ontopolitically-oriented research to describe this approach. My analysis will focus on the project's methods, describing the ways it devised and implemented methods best able to articulate its aims, and the key discussions and steps involved in ensuring these methods were as academically rigorous as they were ontopolitically attuned. Specific areas of consideration will include: the methodological performativity of naming, the ontological implications of recruitment, and the liabilities and limits of 'experience' and 'representation'. In concluding, the presentation will propose a set of features of ontopolitically-oriented research, as well as some observations on the steps, obstacles, priorities and pitfalls of ontopolitically-oriented research.

   Assigning, advocating, addicting: Law, drugs and STS *Kate Seear, Monash University*
      Alcohol and other drug studies have undergone an 'ontological turn' in recent years, inspired by ideas from Science and Technology Studies (STS). Separately, through the work of scholars such as Bruno Latour and Kyle McGee there has been an increasing interest in the

use of STS concepts to study the law (or 'assignation', as Latour now prefers). Despite growing interest in the application of STS to the study of alcohol and other drug 'addiction', and to the study of law, there has been little work that brings these two literatures into conversation. This paper attempts to do so, through considering how STS insights about the instability, complexity, fragility and multiplicity of objects such as 'drugs' and 'addiction' might be mobilised in legal practice. I consider what STS means for drug law, especially where law and legal practice proceeds on the basis that legal 'facts' and 'truths' exist prior to legal intervention, or are 'discovered' – rather than made – through legal processes. I draw on data collected in Australia and Canada for a research project on addiction in the law, including statutes and case law, and interviews with lawyers and judges. I argue that STS insights challenge assumptions about 'facts' and 'truths' in law, including concepts and claims frequently made about the agency and properties of drugs and of addiction. I explore what this 'ontopolitically-oriented' approach to legal practice might mean for drug law and law reform, and consider how it might inform and inspire lawyers to advocate in radically different ways.

Making testosterone matter in motivations for steroid injecting
Renae Fomiatti, National Drug Research Institute, Curtin University
Anabolic-androgenic steroids are synthetic derivatives of testosterone. They are thought to be the most commonly used performance and image enhancing drugs (PIEDs) in Australia. The motivations for men's use of steroids and other PIEDs is a key area of interest for researchers. Established ways of understanding these motivations highlight men's performance and/or image-related concerns, such as the desire for increased physical size and strength, or body-image dissatisfaction, in the context of contemporary masculinities and gender norms. Although testosterone consumption is associated with the politically freighted social practice of injecting, researchers have paid little attention to how the social and political features of testosterone shape and transform steroid use. Instead, testosterone tends to be taken for granted as a 'messenger of sex' that acts on the body in predictable and routinised ways (e.g. increasing muscle mass and size, adversely affecting mental health). This paper takes a different approach, drawing on interviews conducted for a new Australian research project that focuses on men who consume PIEDs to consider how their understandings of testosterone co-produce their consumption patterns and practices. Drawing on feminist science studies, I investigate how the cultural and symbolic meanings assigned to testosterone shape the ontological politics of this consumption. Assembling an 'ontopolitically-oriented' account of testosterone – as an emergent social and biopolitical gathering rather than as a stable sex hormone – allows us to better understand the forces motivating and mediating men's PIED consumption, in particular, pervasive ideas about sexual difference and the biology of gender.

Take-home naloxone and the ontopolitics of care *Adrian Farrugia, National Drug Research Institute, Curtin University*
Naloxone is an opioid antagonist used to reverse the life-threatening effects of an opioid overdose. The term 'take-home naloxone' refers to naloxone that is administered by non-medically trained people during an overdose. The little sociological research on take-home naloxone available emphasises the importance of local social relations, noting, that unless naloxone is administered with care it can cause distress and be experienced as a punishment. However, researchers are yet to analyse the social dynamics that shape how the technology is taken up, administered and, ultimately, how it 'works'. I draw on interviews collected for a new Australian project on take-home naloxone to consider these issues. Using Bruno Latour's work, I argue that technologies such as take-home naloxone are co-produced within social relations and, therefore, 'afford' rather than determine certain outcomes. Adopting a case-study method I identify an interpersonal 'politics of care' in which the affordances of take-home naloxone take shape within interpersonal caring relations. Importantly, this politics of care calls upon particular people to respond to overdose, and thus to take part in an ontological politics of care that exceeds standard understandings of naloxone as simply an 'emergency medicine'. First, I identify a regime of care within an intimate partnership that allows a participant to care for her terminally ill partner. Second, I identify a political process in which a participant takes care of opioid consumers, 'gently' administering it with a sensitivity for care beyond revival. I conclude by exploring the ontopolitical affordances of a politics of care approach for the dissemination and uptake of take-home naloxone.

Session Organizer:
Adrian Farrugia, National Drug Research Institute, Curtin University

229. Games in the City, Games in the Home
Closed Panels
Traditional (Closed) Panel
4:00 to 5:30 pm
ICC: E3.4
Gaming - in all its forms - has become an ever more profitable, ubiquitous, and culturally recognised form of entertainment in many countries around the world. In the process, the everyday sites where games are played - from the home to the streets and public spaces of cities - as well as people's activities in them are being reconfigured and reconceptualised. This panel presents research related to the way games represent the space of the city and the home, and accordingly how they shape human interaction in these spaces. The papers includes research into games as interfaces for experiencing and mediating the city, as texts that represent domestic and urban environments, as communal play experiences that reshape household experiences, as archives that accumulate in homes, and as systems that impact on interpersonal relationships.
Participants:
Finding Shelter: How People Game Domestic Relationships
Mahli-Ann Rakkomkaew Butt, University of Sydney
Online harassment and misogyny impacts how people navigate online and offline spaces, how they play games, what type of games they play, and where they play games. Women often avoid playing online multiplayer games, and avoid using microphones during gaming, as ways to avoid sexism, unwanted attention, and harassment. One of the ways that this study observes women participating in multiplayer gaming is by playing with their partners in their domestic private spaces. This paper unpacks this

occurrence of gaming in the home as part of a larger ongoing ethnographic research project which combines fieldwork of 'offline' gaming spaces, 'online' digital ethnography, and interviews with people who play videogames with their partners. It uses a theoretical framework which observes affective networks (balances, structures and mediations of power), affordances (a delineation of the limitations and abilities of power to impact and be impacted) and gender dynamics (the influences of powers such as toxic masculinity and gender roles imposed by societal norms) within 'public' gaming spaces and within intimate gaming relationship in the 'private' domestic sphere. In approaching gaming culture in a way which contextualises and entangles the public-private and online-offline spheres of gaming, this paper collates qualitative data from interviews, surveys, and ethnographic fieldwork to argue that the threats of misogyny and harassment attached to gaming online and attending public gaming spaces infiltrates women's private domestic spheres and their intimate romantic relationships.

The home, the city, and the wild in avatar-based videogames *Robert David Ewan Fordyce, The University of Melbourne*

This paper argues that developments in videogames over the last ten years have seen new mechanisms of emotional investment in domestic-, nature-, and city-based spaces emerge in avatar-based gameplay. In doing so, this paper reports back on a ludological survey of 71 videogames selected for their economic and aesthetic representations of cities, homes, and natural spaces. The city has been a focus of digital videogames since the earliest days of their release. In Hammurabi (1978) for instance, one takes on the role of a ruler of an ancient city, warding off famine and managing the lives of its citizens. With the release of The Sims in 2000, the architectural focus in videogames shifted towards domestic spaces, with an increasing focus on building homes. While both tendencies have developed their own trajectories, there are a number of games where these two forms of gameplay converge. A number of key games, notably Dwarf Fortress (2006), Minecraft (2009-), and the videogame series for The Witcher (2007-), Dragon Age (2009-), Mass Effect (2007-), Watch_Dogs (2014), and Assassin's Creed (2007-) series, detail complex interrelationships between cities, homes, and wilderness spaces. This paper will build on published work (Fordyce 2018) to report back on a theorisation of the different forms of investment that become possible in these digital spaces.

Producing Platforms for Locative Play *Kyle Moore, Mr*

In July of 2016, the mobile gaming landscape shifted dramatically with the release of the highly anticipated and the intensely popular Pokémon GO. In 2018, Niantic are set to release another augmented reality game, Harry Potter: Wizards Unite. Both games share one common feature, that location is represented as a node within a vast map of the world, building on data aggregated from Google Maps and algorithmically filtered crowd sourced locations from Niantic Lab's other two location-based applications Ingress and Field Trip. Whether they are Pokéstops, Gyms, or Ingress Portals, locations become present in these games via the collective labour of mobile game players. Place and location intersect then not just in terms of presentation, but a larger sociocultural production of place. I argue that, through this process of

exporting and abstraction of labour, Niantic have created a platform for producing location-based game, suitable to expand across a number of intellectual properties. Through the construction of playable platforms, Niantic have created a monopolisation of representations of urban life and conditions. This paper draws from ethnographic observations of Ingress communities within Sydney and asks what is at stake when the labour of these communities is abstracted and ported to new location-based games. While it is unclear how Harry Potter: Wizards Unite will represent urban environments, it is clear that the embedded differential mobilities which preference play in the cities present in both Ingress and Pokémon Go will impact future location-based technologies and games.

She Shares Shelfies: The Presentation of Boardgame Collections at Home and in Public *Melissa J. Rogerson, University of Melbourne*

Boardgames occupy space in the home both as a material collection of artefacts and as a playable resource. Boardgame hobbyists value variety in gaming, and frequently accrue large collections of games. Our research shows that boardgame hobbyists customise their homes to accommodate these game collections, for example through placement of shelves within the home, but also through the design or selection of a home that will accommodate space for gaming. Moreover, the games themselves act as a proxy for the owner's engagement with their gaming hobby. These material artefacts can represent both the history of the owner's interactions with the game – the place they bought it, or first played it – and the promise of future enjoyment when the game is next brought to the table. Although this appropriation of space occurs within the private space of the home, many gaming hobbyists share it publicly in the form of "Shelfies" – pictures of game shelves, often with accompanying commentary. Through Shelfies, hobbyists share their game collection – as well as, more broadly, the way in which they have customised and presented it within their home – with a broader public. This allows hobbyists to move their private practices of gaming within the home into a more public environment. In this paper, we describe the way that boardgamers' large collections are integrated into their home, demonstrate how this sharing of Shelfies is part of the broader process of the appropriation of boardgames into the hobbyist's life and the representation of themself as a (board)gamer, and examine how this is realised as a public presentation of private space.

Playing and Being Together: Materiality of MMORPG and its Construction of New Urban Life for Young Females in China *Xiaoxu Chen, Tsinghua University; Chadwick WANG, Institute of Science, Technology and Society, Tsinghua University*

Putnam argued that increasing uses of technology and media and the movement from urban to suburban lifestyles have altered society to be less connected in America. The same is true in China, except that the movement is from countryside to urban. Thus, solitude, existing in mega cities rather than traditional Chinese countryside, is considered to be connected with everyday life practice especially for those young female. Online game(MMORPG), regarded as "third space", was believed to help build up new connections. This studies accordingly intended to follow these young females who

played a popular game called World of Warcraft, into their online and offline life to explore the complex mechanism between game playing and solitude. Participant observation (6 months) and in-depth interview (N=40) were employed to collect their life experience data. Our research confirm that MMORPG become a useful way for these isolated young females to gain social support to be integrated into the city: a)online games itself can provide a space for being alone together experience, b)while the online game group can provide females with emotional support whether online or offline. Overall, our research support previous study, arguing that solitude would be treated as "social solitude" in contrast to "solidarity", rather than traditionally treated as loneliness, anomie, and social disorder. Key words: urban life, social support, online game, feminism

Session Organizer:
Robert David Ewan Fordyce, The University of Melbourne

230. Life, Biopolitics and Techno-identities 2

Single Paper Submission
Open Panel
4:00 to 5:30 pm
ICC: E3.5
Participants:

Inside a Patient Organization in Russia: "Not-so-Epic" Story of Maintaining Patient Activism *Alexandra Endaltseva, L'École des hautes études en sciences sociales / Linköping University*

Intervention of patient organizations into the health(care) decision making in the 20th century has shaken (or attempts to do so in the different parts of the world) the long-preserved grounds of scientific credibility and the meaning of science and technology (Epstein, 1996); policy making (Moreira et al., 2014; Rabeharisoa et al., 2014); diagnostics and provision of care (Callon & Rabeharisoa, 2008; Dagiral & Peerbaye, 2016); and power distribution between patients and specialists (Akrich, 2008), to name a few. At the same time, such intervention has shaken the inner maintenance of patient organizations, including retention of members, resource base, and daily tasks. By focusing on the invisible processes of organizational maintenance, this presentation invites to regard a patient organization beyond a pressure group, a community of practice or a social institution and to pay attention to its ecology or network of care and knowledge. Grounding myself in the ethnographic material, collected by active participation in the life of Russian Multiple Sclerosis Society, I look at the infrastructure that powers the agency of patient organization in Russia. I tap into the processes of the invention of rehabilitation practices; optimization of scarce technical and material resources; retention of patient activists; trivial psychological support; tensions and friendships; finding and using physical space, and gender- and ability-based division of activist work and care work. Finally, I situate this infrastructure maintenance in Russian Federation, where patient organizations continue the search for identity shortly after their first official appearance along with transition times in the 1990s.

"Being You is Not Sick": (De)medicalization of Thai Kathoey Identity *Alyssa A Lynne, Northwestern University*

In this paper, I examine how Thai kathoey - who are variously labeled "second-kind-of-woman," "third gender," or "male-to-female transgender" - embrace and resist medicalization of their identities. Though Thai kathoey are often described as male-to-female transgender because they experience incongruence between their birth sex as males and gender identity as females, their identity has historically not been understood to be a medical/psychiatric condition. As medical tourism for gender reassignment surgery (GRS) increased from 1990-2010, Thai legal and medical institutions formalized medical and psychiatric considerations of transgender identity in two important ways: first, by adopting medical therapies outlined in the "Standards of Care," a set of guidelines published by the World Professional Association for Transgender Health (WPATH), in treatment of both kathoey and Western transgender patients; and second, through a 2009 Thai Medical Council ruling that all patients seeking GRS must provide letters from two psychiatrists confirming a gender dysphoria diagnosis, a Western-originated practice. Here, I employ participant observation at the Kathoey Rights Organization (KRO) and interviews with 12 Thai kathoey to show how medicalization and demedicalization of kathoey identity occurs simultaneously in light of these recent regulatory changes. Whereas the medicalization of hormone therapy through increased supervision by physicians is actively advocated for by KRO, the organization also works to demedicalize GRS by organizing a campaign to have any diagnosis for gender nonconformity removed, including the proposed "gender incongruence" in the upcoming eleventh revision to the International Classification of Diseases (ICD-11). In both of these practices, lay expertise plays a crucial role.

Struggle for Connection: From Queer Rebels to Pharmaceutical Conformists *Yi-Tsun Chen, The Australian National University*

To avoid confronting criticism and resistance about their poor adherence to a collective doctrine, tongzhi (LGBT populations or Comrades) in Taiwan began to anonymously appear online in throughout the nineties. By sharing their unconventional desires with each other, scattered comrades were networked to establish local social movements to rebel against the heterosexual hegemony. Despite interpersonal relationships emerged online are not commonly viewed as tangible as those developed in public, sexual minorities became more visible and mobile in this rather tolerant digital milieu. To be precise, the usual reservation about disclosure of personal and often eccentric sexual practices was less concerned by individuals having access to supporting networks to back them up. It is now through cyber connectivity, that health conditions and everyday struggles facing HIV-infected comrades are constantly updated to internet connected individuals through their mobile devices. Once a person's approved "therapeutic citizenship" is verified, they are accepted as members of digital "secret societies" or private online groups where "positive care" is accessible. Witnesses, such as peer educators, HIV case managers, and health professionals can now offer measures to timely rectify one's inability of consuming prescribed pills regularly, for instance. Through exploring ganranzhe's (HIV-infected individuals) participation in such social networking, this paper discusses how the topic of drug resistance by individuals is communicated to shape their connection with others

and the state. It argues that the state governance of recalcitrant lifestyles is facilitated by the digital form of decentralized management imposed by queers on oneself and their comrades.

Between Persuasion and Coercion: Situating Mandatory Influenza Vaccination Policy of Healthcare Personnel (HCP) *Rachel Gur-Arie, Ben-Gurion University of the Negev*

Vaccinations are important for preventing influenza infection. Maximizing vaccination uptake rates (80-90%) is crucial in generating herd immunity and preventing infection incidence. Vaccination of healthcare professionals (HCP) against influenza is vital to infection control in healthcare settings, given their consistent exposure to high-risk patients like: those with compromised immune systems, children, and the elderly. Though vaccination is vital in disease prevention, influenza vaccination uptake among HCP is low overall (50% on average). Mandatory vaccination policies result in HCP influenza vaccination uptake rates substantially higher than opt-in influenza vaccination campaigns (90% vs. 60%). Therefore, influenza vaccination should be mandatory for HCP in order to best prevent influenza infection in healthcare settings. Many HCP cite individual objections to influenza vaccination rooted in personal doubts and ethical concerns, not best available scientific evidence. Nevertheless, HCP ethical responsibility to their patients and work environments to prevent and lower influenza infection incidence overrules such individual objections. Additionally, mandatory HCP influenza vaccination policies respect HCP autonomy via including medical and religious exemption clauses. While vaccination as a prevention method for influenza is logically sound, individuals' actions are not always rooted in logic. Therefore, I analyze HCP perceptions and actions toward influenza vaccination in an effort to better explain low HCP uptake rates of the influenza vaccine and individual objections to influenza vaccination. In summary, mandatory HCP influenza vaccination policies are ethically justified, effective, scientifically-supported method of maximizing HCP influenza vaccine uptake and minimizing the spread of the influenza virus within healthcare settlings.

Session Organizer:
Eric Deibel, Bilkent University
Chair:
Eric Deibel, Bilkent University

231. **Global Perspectives on Responsible Innovation: Widening the Gaze I**
Papers for Open Panels/Global Perspectives on Responsible Innovation: Widening the Gaze
Open Panel
4:00 to 5:30 pm
ICC: E3.6
Participants:
Between Inclusiveness and Responsibility. STI policy agendas, frameworks and practices 'towards society' in developing countries *Hernan Thomas, IESCT-UNQ (Institute of Science and Technology Studies - Universidad Nacional de Quilmes) / CONICET (National Council of Scientific and Technological Research); Gabriela Bortz, IESCT-UNQ (Institute of Science and Technology Studies - Universidad Nacional de Quilmes) / CONICET; Santiago Garrido, IESCT-UNQ (Institute of Science and Technology Studies -*
Universidad Nacional de Quilmes) / CONICET
In recent years, a series of prominent –and rather ambiguous- terms such as "inclusive", "social" and "responsible" applied to innovation gained strength, marking a normative turn in an understanding of Science, Technology and Innovation "towards society", bringing with it new sets of national and international policy recommendations, discourses, planning, instruments and incentives. This trend arose from a disenchantment with hegemonic evolutionary economy premises in terms of actual socio-environmental benefits and STI governance processes, questioning competitiveness and economic growth as the key goals of STI policies and assumptions of social welfare for all as a trickle-down effect. While Responsible Innovation narratives gained presence in developed countries, the Global South predominantly took up on Inclusive Innovation approaches, but dialog between both perspectives has still been scarce. In Latin America, scholars and policy makers have embraced Inclusive Innovation discourses focusing the agenda on inequality and poverty problems. In the different countries, these have been transformed and locally redefined by the interaction between policy makers, scholars, social movements, NGOs and firms, adopting different conceptual forms ("social technologies" in Brazil, "technologies for social inclusion" in Argentina, "socially oriented innovation systems" in Uruguay), policy aims and being translated into diverse policy instruments that contend/adjust the hegemonic ones. Exploring different understandings on "what is inclusive" STI across the globe, and how these visions translate into national policies and practices in Latin America, this work aims to establish a dialogue with Responsible Innovation premises, looking for contact/divergence points, exploring its adequacy and relevance for the Latin American setting.

Globalizing Responsible Research and Innovation: Experiences in international collaboration for RRI *Tess Doezema, Arizona State University*

The RRI-Practice project has embarked on an explicit project of globalizing RRI, joining a group of scholars from 12 countries to conduct a set of national and organizational case studies analyzing the state of and promoting responsible research and innovation as defined in combination between the EC, the project partners and the research subjects. The project aims to leverage the national case studies in a coordinated effort between the partners to generate scalable knowledge about best practices for the wider implementation of RRI. The flexibility of RRI can be read as a definitional weakness or as a strength, in providing opportunities to promote dialogue and reflexive engagement by a diverse array of interested actors across national settings. The contrast between more topical definitions, such as the EC defined "keys," and process based approaches —such as anticipation, reflection, deliberation, and responsiveness (Owen et. al. 2013)—have been depicted as creating confusion and ambiguity around the aims of RRI. But, in cross-national contexts, the concrete entry point of the keys, and the open invitation to define responsibility in these and other areas, may support the process-based aspects of the project. Interpretive flexibility is indispensable to RRI when working across contexts, and initial research results indicate that creating openings for

reflection on the relevance of particular keys and the meaning of responsibility in diverse scientific settings can advance the core RRI process commitments cited above.

Innovation as interaction processes: the socio-technical constitution of Mondragon Cooperative Corporation (MCC) *Juan Carlos García-Cruz, Universidad del País Vasco, España.*

Recently the 8th R&D Framework Program (2014-2020), also known as "Horizon 2020", which openly claims research and innovation heterogeneously, or inclusively, constituted from a "Science with and for Society" approach. This approach underscores the value of research and innovation for the resolution of pressing social and environmental problems resulting in RRI, which would imply a subversion of borders disciplinary and social research. Under this perspective, the challenge is to explain the processes of inclusion through case analysis, which consist of facing examples of inclusive innovations, giving way to the description of the constitution of interaction networks. Namely, and respectively (but interactively), the intention and capacity to: (i) conceive and consider a wide variety of possible scenarios linked to innovation; (ii) rethink and reconsider preferences, values, and knowledge in light of the formulation of those scenarios; (iii) open up those visions, preferences, values, and knowledge to collective deliberation processes; and (iv) develop effective governance mechanisms that institutionalize the collective or inclusive constitution of innovation (Owen, Stilgoe, Macnaghten, Gorman, Fisher & Guston, 2013, Stilgoe, Owen & Macnaghten, 2013) (Eizaguirre et al., 2016). The purpose of this paper is to explain innovation as interaction processes through the socio-technical constitution of the Mondragon Cooperative Corporation, which has been the focus of multiple analyzes that ask about the keys to its success, its culture, its technology, its management and its innovation model, which includes more than 11,875 million euros in annual revenues, 260 cooperative companies, 15 technological centers, 74,117 cooperative members and with productive subsidiaries and corporate delegations in 41 countries and sales in more than 150. The work is divided into three parts. In the first one, we will describe the socio-technical integration of the societal, ethical, cultural, environmental aspects and aspects in the scientific and technical practices of the Mondragón Corporation since the constitution of the first technological device, the Maite oil furnace. In the second part, I will describe the interaction processes between the actants that constitute MCC. Finally, in the third part, I will present some findings to understand innovation as a process of interaction through the socio-technical constitution of MCC.

'Opening up' science policy? Engaging with RRI in Brazil *Marko Monteiro, State University of Campinas; Luis Ignacio Reyes-Galindo, State University of Campinas - UNICAMP; Phillip Macnaghten, Wageningen University*

This paper presents initial results from the Brazilian team in the Responsible Research and Innovation in Practice (RRI-P) collaboration, concurrently running in 22 countries. The project invites reflection from institutional actors through a variety of exercises that focus on RRI's potential for 'opening up' and impacting on national science and innovation policy. The first such exercise is an early-stage national workshop that is the object of this article. We describe how RRI was viewed by the participants in the Brazilian workshop, yielding an initial approximation on how RRI is likely to be perceived by actors involved in science, technology and policy in the wider national context. We subsequently reflect on the workshop itself as an engagement exercise and discuss its potential to open up policy dynamics in Brazil. Largely unknown in the Brazilian context, RRI-led engagement exercises were embraced by workshop participants as a means to exert a positive influence in opening up science policy discussions, by creating bridges between RRI research and policy actions; as an enabler of dialogue on issues not usually addressed in existing policy debates; and as a source for new framings for existing, stalemated problems. Despite its potential for opening up policy, we also discuss how RRI nevertheless faces the inherent hurdle of surpassing longstanding Brazilian traditions of hierarchical governance and linear models of innovation, both pervasive in the country's political institutions.

Session Organizers:
Sebastian Michael Pfotenhauer, Technical University Munich
Nina María Frahm, Technical University Munich, Munich Center for Technology in Society

232. Making Biofutures: Anticipating the futures of biomedicine, healthcare, and life itself
Closed Panels
Traditional (Closed) Panel
4:00 to 5:30 pm
ICC: E3.8

Life is being (re-)imagined and remade in biomedicine. Future-oriented visions of hope, hype, and fear are animating the emergence new bioeconomies: novel biological entities are being created and circulated, subjectivities and identities are being fashioned, and regulatory structures are being reconfigured. These envisaged futures may relate to national wealth-building aspirations such as those associated with regenerative and precision medicine. They may relate to the fear of emerging bio threats such as anti-microbial resistance. Or, as the case of cross-border reproductive care and healthcare tourism, they may relate to the more local, private aspirations of individuals and families. This panel will bring together leading scholars from STS, sociology, and anthropology to explore how discourses and narratives of promise, hope, expectation and fear are shaping biotechnology and biomedicine, and thus how particular futures are being constructed in the process. The Biofutures Panel will explore how human health and the production of human life are being transformed with these developments, and address related ethical and public policy questions. Ultimately, the aim of this panel is to reflect on the futures that are likely to materialise, to anticipate the potential tensions and opportunities within these futures, and thus to address the questions: what futures do we want? And, importantly, how can STS contribute to the construction of inclusive futures that align with the values of wider publics?

Participants:
Big data and bold visions: The political economy of the emergent algorithmic medicine and healthcare *Alan Petersen*

According to commentators, big data will profoundly change the practices of medicine and healthcare in coming years. Notably, genome sequencing enabled by big data analysis, it has been argued, will allow the realization of 'personalised medicine', involving the 'tailoring' of treatments to individuals, and thus the elimination or minimization of adverse drug reactions.

Such data are already finding application, for example by Australia's health information company Genome.One. The impacts of the purported data revolution, however, are anticipated to go beyond medicine, to include the aggregation of 'real time' data of public health significance (e.g. data on individual activities and consumption practices), to enable or facilitate the prediction and prevention of disease and other adverse health outcomes. This envisaged big data-driven vision has some powerful supporters, and it has served to attract huge investment from governments and the private sector, keen to capitalize on developments. This paper offers a critical perspective on the promissory discourse underpinning these big data initiatives. I focus on the political economy of algorithmic medicine and healthcare, and I argue that the history of algorithmic medicine and healthcare reveals a significant long-standing commitment to belief in the 'power of numbers'. However, despite extensive efforts to realize this future medicine and healthcare, developments are unlikely to play out in ways envisaged, for reasons that I explore. Nevertheless, the impacts of efforts to realize algorithmic medicine and healthcare are far reaching, including increasing surveillance and growing inequalities in health and healthcare.

Making the future (socially) robust: ELSI as authoritative endorsement of biomedical promise *Koichi Mikami, KOMEX, University of Tokyo*

It is argued that future visions of science and/or technology have important functions in present time, such as inviting more investment of a range of resources in their development and making arrangements suitable for their future adoption. In this presentation, I examine development of regenerative medicine in Japan and discuss in what ways discussion about its ethical, legal, and social issues (ELSI) has served such functions. As I have argued elsewhere, after the invention of a novel cell reprogramming technique to produce stem cells from somatic cells by Shinya Yamanaka and its application to human cells in the mid-2000s, regenerative medicine research became a national endeavour in the country, despite that its clinical advantage and commercial potential still remain uncertain. From the beginning, ELSI of stem cells were critical for the research to achieve this special status, and there are several key moments over the last decade when addressing ELSI highlighted and increased desirability of the technology for the country. Analysis of some such moments suggests that ELSI discussion is a powerful social device to construct the past, present, and future of the technology, potentially strengthening the promise that the society will benefit from its development, though simultaneously acknowledging that it has some 'side effects' to be addressed. And I argue it is powerful because such discussion is often led not by researchers of the technology but by other experts including scholars of humanities and social sciences – i.e. those believed to belong to the other side of the science-society divide.

Remaking parents: Mitochondrial replacement therapy (MRT) and the fiction of genetic parenthood *Catherine Mills, Monash University*

For a long time, it has been understood that all human offspring have two genetic progenitors, who could be considered parents by virtue of that genetic relationship.

Mitochondrial replacement therapy (MRT) challenges that presumption, since it involves the use of genetic material from three people in the creation of embryos. In the UK, regulation of MRT has dealt with this by stipulating that egg donors in MRT arrangements are not genetic parents even though they contribute mitochondrial DNA to offspring. Other countries, including the USA and Australia, are still struggling with the issue of whether such donation undergirds parenthood, and the rights and obligations that go along with it. There has also been much scholarly discussion about whether the offspring of MRT arrangements are justly thought of as '3-parent' babies. My aim in this paper is to consider the implications of this situation for thinking about parenthood more generally. In particular, I consider the effects of the legal stipulation of genetic parenthood made necessary by assisted reproductive technologies such as MRT, and suggest that this shows that rather the being simply a natural state of affairs, genetic parenthood is itself a kind of fiction.

The last menopausal woman and other future reproductive imaginaries *Andrea Whittaker, Monash University*

A range of new reproductive possibilities in genetic screening and editing, uterine transplants, ovarian tissue transplants, hormone regimes and demands for stem cells lie in our foreseeable future. Drawing from ethnographic lessons from previous technological advances in reproduction, in this paper I explore the directions of reproductive technologies and the ways in which these will shape future demands and create new markets. I consider how these technologies are reinventing our conceptions of gender, health and embodiment and challenge notions of self and agency. They promise a biofuture in which endlessly flexible interventions and malleable applications purportedly allow for a myriad of new reproductive choices, oblivious to the old stratified inequalities they entail.

Session Organizer:
John Grant Gardner, Monash University, Australia
Chair:
Samuel Taylor-Alexander, Monash University
Discussant:
Ayo Wahlberg, University of Copenhagen

233. Social Studies of Politics: State Affect? 2
Papers for Open Panels/Social studies of politics: state affect?
Open Panel
4:00 to 5:30 pm
ICC: E5.1

Whether in post-industrialized settings of the Global North or the rapidly industrializing contexts of the Global South, a distinctive feature of our contemporary world is the reconfigured but nonetheless pervasive presence of states. The state remains a key mode of societal organisation, despite scholars announcing its "death" or decrying that it is "hollowed-out" as states purportedly contribute to their own undoing in the context of ever-advancing globalization and the contruction and transformation of inter- and transnational modes of governing. Research in Science and Technology Studies (STS) tends to privilege technoscientific advances organized through deliberate (nation) state intercession, either through co-shaping of science and society (Jasanoff) or through intervention into the material environment and through the establishment of infrastructure (e.g., Carroll, 2009; Mukerji, 1997). An under-explored though essential facet for understanding

contemporary politics is affect. How is state affect marshaled in the face of pressures to retreat and to expand? The care and attention that laypeople and officials direct at operations of the state and bureaucratic labor offer a means of locating the sustenance of the state in terms of affect. Bringing this conceptual terrain into prolonged conversation with Science and Technology Studies (STS) affords scholars the opportunity to examine how the 'sensibility' of states is produced even in transnational configurations and how a range of affective dimensions (aesthetic, aural, optic, and even olfactory) come to be entangled with diverse regulatory and administrative processes in the 'care' of national, international and transnational government work.

Participants:

Regulation, science and the state: reproductive technologies in India *Vasudha Mohanka, University of Wollongong*

The inherent paradox in India is the co-existence of population control and infertility management especially since the last 1970s. Since the mid 2000s, the Indian state has been attempting to regulate reproductive technologies. Initially, it appeared that it was following other developed countries that were regulating reproductive technologies. Later, it changed to the need to maintain scientific protocols and ethical procedures. Recently, they began regulating due to controversial cases that drew a lot of national and international media attention and were mired in questions of citizenship, belonging and questions related to care, emotional and affective labour. This paper presents an analysis of English print media focused on one commercially circulated popular English language magazine in India in terms of the relations drawn between science and the regulation of the technology and a cursory analysis of regulatory documents since 2002. I argue in the paper that state regulation of assisted reproduction is ambivalent, paradoxical and complex because of the convoluted relationship between society, culture, and the state's felt need to maintain scientific protocols. Also, the state projects that regulation is in the best interests of science as well as nationalistic agendas around the preservation of socio-cultural norms amidst a growing neo liberal capitalist context. The paper's contribution to STS will be a postcolonial analysis that will look at language, the role of the state, and the nature of knowledge production in relation to science amidst which regulation takes place. Keywords: regulation, science, ethico-legal procedures, culture, media, controversial cases

The Transition of Tokyo Water Supply System: 1875-now *Aobo Ran, Tsinghua University*

This paper examines the transition of Tokyo water supply in social context from 1875 to now and reveals how the idea about state shapes water supply system. Being different from previous studies, which use technological determinism or social constructivism, this paper adopts problem-solving approach provided by Thomas P. Hughes. This paper shows how Tokyo water supply solves urban problems and re-periodizes the history of transition into four periods according to problems that Tokyo faces. During the first period from 1875 to 1911, based on water quality surveys and experiments, Tokyo modernized water supply. In the second period from 1911 to 1947, Tokyo water supply kept the single system because of nationalism/statism. In the third period from 1947 to 1975, Tokyo faced water shortage. The central government intervened in this issue to enlarge Tokyo

water system, which is unnecessary. After 1975, Tokyo water supply entered into diversification period and changed from top-down system to two-way system. By examining this case, we can see that, in the 'care' of nation, globalization, Tokyo initially established the modern/western and undemocratic water supply system, and then transited into the two-way and democratic system.

What development for Uruguay?: A multi-layered analysis of development dimensions and pathways *Isabel Bortagaray, Universidad de la Republica; Marila Lázaro; Amalia Stuhldreher, Universidad de la República*

What Uruguay do we want? What development for the country would Uruguayans want? These are the triggering questions of this paper. The paper is based on a project held in 2015 aimed at discussing about these questions in different contexts: (i) a group of experts through a Delphi survey, (ii) a panel of lay citizens through a citizens dialogue at the local level, and (iii) some specific communities that are often excluded from these inquiries, such as young people from rural and urban settings, from different socio-economic levels; gay lesbian and trans-sexual; and afro-descendants through the implementation of a series of focus groups. In this paper, we only concentrate on the analysis of a public deliberation process held in Tacuarembo (a region of Uruguay) in 2015 by a group of 25 citizens. The paper analyzes the different dimensions of development, as well as the desired development trajectories emerged from this public. More broadly, it seeks to contribute to the discussion on wellbeing and development, and the different consensus and disagreements around them.

Who Speaks For Water in Times of Crisis? Iranian Perspective on Co-production of Engineering and Governance *Ehsan Nabavi*

Water research has devoted relatively little attention to theorising the relationship between water expertise and the state's governance. Studying this relationship is important as it helps to explain the co-production mechanism by which a certain group of experts rise to power, speaking for water—its challenges, and opportunities. Some aspects of this gap has been addressed in the water literature through now-familiar notions such as hydraulic bureaucracy and the hydraulic mission (Molle et al, 2009), in which the prevailing role of engineers in the contemporary water management has been brought into spotlight. STS has also developed particular perspectives on politics of engineering infrastructures and how they become the integral part of state-making process (Carroll, 2006, 2012; Mukerji, 2009; Barry, 2013). However, the dialectical nature of this relationship, particularly when societies are fraught with fear of uncertain future, has remained heavily under researched. Through using the example of Iran's looming water crisis, the paper demonstrates that engineering and the Iranian governance have co-shaped one another, particularly after Islamic Revolution. Focusing attention to unpack this relationship, the paper explains how, and why Iranian engineering epistemic community has (re)directed care and attention at the operations of the Iran's bureaucracy as water crisis looms large. The findings also suggests that invoking sense of fear through warning about dystopian futures—which is common in times of water crisis—play an important role

in producing the sensibility of the state. One of the consequences is that it might perpetuate the domination of established networks of experts (i.e. engineers), their epistemic practices, and institutions of power. This is, of course, a great concern as it can lead to depoliticisation of the water problem, monopolisation of water science, and demonisation of democracy in the process of water governance.

Session Organizers:

Jan-Hendrik Passoth, Technische Universität München
Nicholas James Rowland, The Pennsylvania State University

Chair:

Nicholas James Rowland, The Pennsylvania State University

234. Science, Technology and Society in the Polar Regions (2)
Papers for Open Panels/Science, technology and society in the polar regions
Open Panel
4:00 to 5:30 pm
ICC: E5.2

Despite Antarctica being widely regarded as the paradigmatic "continent for science" since the late 1950s and the Arctic being narrated as one of the most important "laboratories" for studying environmental change in the age of the anthropocene, STS scholarship on the polar regions remains comparatively underdeveloped. The aim of this panel is to explore more analytical discussions concerning science and technology as agents of authority and power over both people, animals and places, considering how the Arctic and the Antarctic are governed, controlled, and exploited. We are particularly concerned with challenging the notion that the polar regions are conceptually separate from the rest of the globe and with, alternately, emphasizing how practices, prejudices, and preoccupations flow across lines of latitude. The kind of questions relating to the co-production of science, technology and global and local societies which the panel aims to contribute to include: How do national science programs enact sovereignty within legal frameworks that either complicate or sideline territorial claims? How does environmental monitoring construct images of fragility? What work does the rhetorical conflation of science with environmental protection do in obscuring other connections, such as those between science and subsurface mineral extraction? To what extent does traditional ecological knowledge in multilateral Arctic governance influence epistemological formations in Arctic sciences? This second panel answers these questions through an array of examples from large scale technological systems, national and justificatory technological determinism and the changing nature of scale and expertise.

Participants:

Militarizing And Demilitarizing The Cold War Arctic: Shifting Technologies, Strategies, And Field Practices *Ronald E Doel, Florida State University*

Early in the Cold War, the Arctic emerged as a center of global strategic conflict. Escalating tensions between the United States and the Soviet Union after 1945 made the Arctic—the geographic midway between North America and Eurasia—a potential theatre of war. Soviet researchers had gained a good understanding of the Arctic's environmental properties through extensive state-sponsored expeditions in the 1920s and 1930s, but American scientists were far less familiar with this region. To effectively operate weapons systems and warning networks in the far north—including the Distant Early Warning (DEW) line in far northern Canada, the massive

Thule Air Force Base in northwest Greenland, and the nuclear-powered city named Camp Century on the western expanse of Greenland's Ice Cap—American officials realized they needed to rapidly gain relevant environmental knowledge. Operating these technological systems inspired Pentagon leaders to fund major new research programs in the physical environmental sciences in the far north. These utilitarian research programs continued through the 1960s—losing momentum only when a new generation of weapon systems (including submarine-based Polaris nuclear missiles) lessened the need for new environmental knowledge for national security. Drawing on recently declassified CIA documents and newly available materials at several presidential libraries, this presentation addresses key factors that influenced research and operational strategies by Western forces in the Arctic. It also draws on two recent internationally comparative historical investigations, funded by the European Science Foundation and Aarhus University.

Mining technologies and (not) mining in Antarctica *Susanna Maria Elizabeth van der Watt, KTH Royal Institute of Technology*

In 1988 a convention was signed to regulate the exploitation of minerals in Antarctica – a continent that has not yet seen any mining operations. Three years later, the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA) collapsed, to be replaced by a Protocol on Environmental Protection that banned all activities related to mineral resources other than scientific activities. In this paper, I am particularly interested in how actors perceived of the role mining technologies would play in the extreme and remote environment of Antarctica. Following a brief historical background to how the potential for extracting mineral resources in has featured in twentieth century Antarctica history, I focus on the 1970s and into the early 1990s, when negotiations for a mineral extraction regime in Antarctica was underway. I ask how Parties to the Antarctic Treaty, but also other actors such as environmentalists and engineers envisioned the technological possibilities for mining in Antarctica, and used it in their arguing for or against mining on the continent. Actors with different views vis-à-vis mining in Antarctica drew selectively on Arctic examples, for example, arguing how cold weather mining technologies can have either destructive or remedial effects on polar environments. I also explore at how the fact that there has been no systematic prospecting for minerals in Antarctica, never mind extraction, played into the debates. Finally, I look at how technology features in current report on mining in Antarctica – reports that often, wrongly, claim that the moratorium on mining will expire in 2048.

For the common good of mankind – and Finnish cold weather technology *Justiina Dahl, KTH Royal Institute of Technology*

In 1988 the first Finnish research expedition was sent to Antarctica. This was preceded by the country signing the Antarctic Treaty in 1984. Both developments had principally been motivated by officials in the Foreign Ministry and the Ministry of Industry and Trade. These officials argued that the world would at some point in the future run out of natural resources. At this time the global markets would turn to Antarctica and start extraction

there. This extraction would take place with technology that "does not exist yet". Before this technology was a reality, the resource potential of the continent would need to be further analyzed through increased research missions. The officials also predicted that the developing states that were seeking prestige and recognition in the world stage would, following India's example, invest into the increased exploration of Antarctica. All these events were seen as a golden opportunity for market expansion for Finnish cold weather technology. Because of these expectations the emergence of the Finnish Antarctic Programme offers one example of what Wyatt (2008) calls actor-based justificatory technological determinism in action. The end result of the simultaneous negotiations for the Convention on the Regulation of Antarctic Mineral Resource Activities illustrates how the ideology of technological determinism in this context was eventually overrun by an environmental one. Both events and their narration in contemporary polar history exemplify how technological determinism is used in the creation and re-creation of boundaries between science, technology and environment in policy – and how easily these expectations are forgotten.

Session Organizer:
Justiina Dahl, KTH Royal Institute of Technology

Discussant:
Britt Kramvig, University of Tromsø

235. Animals and Technology Around the World, Past and Present 2
Papers for Open Panels/Animals and Technology Around the World, Past and Present
Open Panel
4:00 to 5:30 pm
ICC: E5.4

Across time and space, our relationships with nonhuman animals have involved a staggering assortment of technologies. In addition to the technologies we have developed to use with or against animals, animals also have been used *as* technologies, and they continue to serve as inspiration for even more. This panel welcomes papers on animals and technology, from reflective essays and case studies to systematic overviews of past and present practices. We welcome papers focused on any cultural region or historical period of time and those reporting on obscure, esoteric, or failed technologies as well as common, persistent, and/or successful ones.

Participants:

Patients Or Models? Dogs As Laboratory Companions In Cancer Research *Declan Liam Kuch, UNSW; Matthew Kearnes, Environmental Humanities Progarmme, School of Humanities and Languages, University of New South Wale*
The pro-curial framing of biomedical research (Thompson 2013) has brought with it a proliferation of novel laboratory technologies and practices. This paper builds on STS work interrogating mice and primates as sites of translation in laboratory practices to examine how dogs have been integrated into an Australian biomedical research institute. Drawing upon ethnographic study of a laboratory, I examine three economic sites: the family unit, the nation and the university, to critically interrogate how our fantasies about life and death are negotiated with and through canine companions. What role do dogs specifically play in these fantasies that other animals seem unable to fulfil?

Reanimating the Mammoth *Matthew Chrulew, Curtin University*
The excitable discourse around de-extinction is regularly fueled by investors, scientists, journalists and other boosters, appealing to widespread desires to redress anthropogenic ecological wrongs and wounds. Alongside projects to resurrect passenger pigeons, thylacines, gastric-brooding frogs and other creatures driven from existence, that to bring back mammoths is of particular interest for the study of contemporary technoscience and the futures it prophesies and remakes. This woolly cousin of the elephants (who today face their own pressures) features prominently in novels, films and other media reflecting on environmental vulnerability and the place and power of humans among other animals. Some dream of reintroducing mammoths to a rewilded Siberian Pleistocene Park that would help arrest global warming. A de-extincted mammoth — cloned, backbred or synthesised — would be a thoroughly trans-formed and technological animal. It would also be an impoverished one, severed from the ancestral heritage of its kind, deprived of the intergenerational cultural transmission by which mammoth existence was laboriously invented, taught and reproduced. Building on recent work in philosophical ethology and extinction studies, this paper will analyse these simultaneously troubling and captivating mammoth de-extinction projects. What animates reanimation?

Sounding the Alarm: Animals as Anticipatory Technologies in Practices of Futuring *Stephanie Lavau, The University of Melbourne*
Animals have long figured in efforts to sense environmental threats and warn of potentially catastrophic futures, from the monitoring of declining fish populations to signal the industrial pollution of European rivers in the 18th century, to the 20th century practice of using canaries as sentinels for dangerous gases in coal mines. In contemporary practices of environmental science, management and policy, certain species are formalised as biological indicators that signify current environmental condition, track environmental change, and foreshadow ecological futures. Future threats that are more or less imperceptible to human senses and/or undecipherable by scientific instruments – climate change, radiation, pollution, emerging diseases – are instead made detectable through the bodies and behaviours, distributions and deaths of animals. This paper is informed by a research project that intersected fieldwork in sociology, ecology, sound and visual art, in exploring and experimenting with the ways in which the environmental condition of a river is apprehended in a diverse range of academic, practitioner and local knowledge practices. In addressing animals as 'anticipatory technologies' in practices of futuring, I invoke Helmreich's (2016, xxii) concept of "sounding" to argue that these practices are not merely a matter of 'seeing the signs'.

Technopolitical transformations of insect bodies: managing beekeeping in Australia *Catherine Phillips, University of Melbourne*
The 'pollinator crisis' – the death rates of bees in particular – has garnered much scientific and public attention of late. Dealing with the loss of bees has most often been considered in technical terms – finding and

mediating the cause through innovation in science and technology. However, it is increasingly clear that beekeeping as natureculturetechnics (Law 2004) requires attention. This paper explores beekeeping technologies, as a contribution to work on more-than-human politics. Drawing from STS-inspired research on animal biopolitics and mundane technologies, bees are figured in three ways: first, as captured creatures, contained and governed through technological means; second, as technologies of surveillance, acting as sentinels and sensors; and third, as managed labourers that provide fundamental ecosystem services. Each figuration contains contestations that raise questions about the roles of bees and beekeeping in agrifood systems, and beyond. By attending to the technologies and controversies implicated in beekeeping, this study offers insight into how more sustainable and just relations might emerge among those involved – insects, plants, people, and others besides.

Using Citizen Science to Study Bird of Prey Migration In Southern Ontario *Antoinette Battaglia, York University*

Citizen Science has become one of many tools for assessing the state of wildlife populations. It is also a form of bridging the apparently widening gap between human society and the more-than-human environments. As human populations increasingly become more urban, it becomes necessary to integrate urban areas and human activities as part of conservation planning. Many bird watching traditions have evolved in societies independently from the scientific community, and are popular activities within naturalist communities. As an ecologist by training, my research evaluated the observation data collected by Hawk Watch volunteers in several locations in Southern Ontario, Canada, to derive population trends of the bird of prey species observed, in relation to migratory preferences in topography. This paper will reflect on this experience, and on the changing landscape of citizen science as volunteers and ecologists interact over their common interests in charismatic species conservation. I will then speculate on the futures of approaches such as citizen science, to negotiate human-nonhuman relationships in flux in a changing world. Finally, I will offer insights on the politics of knowledge creation through such citizen science conservation efforts.

Will They Bite? Leeches and Sociotechnical Agencies in Ayurvedic Medicine *Lisa Allette Brooks, University of California Berkeley*

In classical Ayurvedic medicine leech therapy is the mildest of three gentle methods of bloodletting. This paper examines the ways that leeches challenge and exceed conventional categories both in terms of Ayurvedic classificatory schemes for technologies of healing—including medicines, medical actors, and surgical instruments—and also in terms of STS theorizations of non-human agencies, particularly the category of "actant." During an Ayurvedic leech therapy session, a leech may or may not be enticed to engage in the treatment process, biting and sucking, simultaneously ingesting human blood and releasing analgesic and anticoagulant saliva into a particular spot on patient's body. In the course of leeching, impure blood is sucked from a patient's vein and then undigested blood is purged from the leeches by an Ayurvedic practitioner. Leeches are then cleaned with herbs, rested, and fed before being engaged in the blood sucking process again. This study is based on ethnographic research in an Ayurvedic clinic in Kerala treating lower leg venous ulcers, and primary text translation of first millennium classical Ayurvedic texts and commentaries in Sanskrit referred to in the course of practice. Both on the page and in the clinic, leeches exert considerable agency in their willingness to comply with the protocol. Their behavior guides the procedure and provides extra-sensory information about the patient's pathology to the physician. Guided by affective feminist STS methodologies this paper foregrounds affinity and entanglements while thinking with leeches as agents critically shaping this form of Ayurvedic medical practice.

Session Organizers:
  Christena Nippert-Eng, Indiana University
  Patrick C. Shih, Indiana University Bloomington
Chair:
  Patrick C. Shih, Indiana University Bloomington

236. The Politics of Science and Technology in International Development Open Panel 3
Papers for Open Panels/The Politics of Science and Technology in International Development
Open Panel
4:00 to 5:30 pm
ICC: E5.6
Participants:

Digital Matatus: the discursive and material effects of data science in Africa *Kerry Holden, Queen Mary, University of London; Matthew Harsh, Cal Poly*

One of the ways to get around a city like Nairobi, Kenya, is by catching a matatu. These are privately owned mini-buses that serve the city as a major source of public transportation. They will be recognisable to many because of their brightly painted exteriors, some featuring slogans, ironic comic strips and cartoons. The matatus (or taxis depending where on the continent you are) are regularly held up as symbolic of the chaos of African cities and the shortcomings of state provision. They do not operate in a centrally regulated transportation system and they harbour a murky criminal element with known gangs operating many routes. Since 2012, the matatus of Nairobi have served as an ideal experimental subject for exploring the uses of data science in mapping and ultimately improving the inefficiencies of semi-formal and informal urban transit. The Digital Matatus Project (DMP) brings together scholars from US and Kenyan universities to develop an online, digital map of Nairobi's matatus, including routes, directions and timetables. The completion of the map, which mimics the London underground map, marks the launch of a worldwide mission to use data science to bring order to the chaos of para-transit in cities across the world. Strikingly, the most problematic cities are located in the Global South. We present a critical reading of the DMP that focusses on its politics and poetics. Maps and statistics represent attempts to manage territory, populations and resources. Read in this way, the DMP can be understood as an exercise in governing urban space. However, ethnographic research reveals that the way the map was made is incongruent with the final product and the mission statement of project leaders. The map's availability open access quickly renders it unrepresentative in a commercially competitive system,

but then, the map also appears to have very little use-value among Nairobi's residents, who continue to move around the city in much the same way as they always did. In light of these concerns, our question turns on what the digital map is for, if the political purchase and material effects are negligible?

Making "Appropriate Technology" African: Biomedical Technology from CASTAFRICA to the Global Health Innovation Accelerator *Heidi Morefield, Johns Hopkins University*

In 1974, the Conference of Ministers of African Member States Responsible for the Application of Science and Technology to Development, known as CASTAFRICA, gathered in Dakar. Their focus was on finding African solutions for development challenges, particularly in healthcare, and on their dissatisfaction with donor assistance which was seen as self-serving, inefficient, uncoordinated, and out of touch with the real needs and desires of newly independent African countries. The concept of "appropriate technology" emerged as a potential solution, though how it was defined by CASTAFRICA attendees—novel technologies designed for the particularities of the African continent—differed starkly from the appropriate technology programs on offer from Western donors, which tended to focus on older, simpler, off-patent technologies. Based on archival records, fieldwork, and oral history interviews, this paper follows the appropriate technology concept as it was applied in biomedicine—from the initial CASTAFRICA position papers, through, 40 years later, the opening of the Global Health Innovation Accelerator (GHIA) in Cape Town. An incubator for African innovations in global health technologies, the GHIA is run by the Program for Appropriate Technology in Health (PATH), an American foreign aid contractor, in partnership with the South African Ministry of Health. This paper, which comprises my initial findings from NSF-funded fieldwork at the GHIA and PATH labs, will argue that, as Southern Africans pushed back against Western definitions of appropriate technology in international health and foreign aid, they actively shaped the technocentric logic of the then-emerging field of global health.

Producing Biomedical Value and Commodities in Global Health and Development *Kirsten Moore-Sheeley, Johns Hopkins University*

What is the value of biomedicine in global health and development, and what bodies of knowledge are involved in defining this value? While not only applicable to the recent past, these questions are immensely important to understanding the development and dissemination of global health interventions over the past three decades. I examine these questions by looking historically at the construction and circulation of a major global health technology—the insecticide-treated net (ITN). Shown in randomized controlled trials to save children's lives, this anti-malaria tool has become a target for substantial development, corporate, and humanitarian funding. However, the justification for the uptake of ITNs for global malaria control, particularly in Africa, cannot be reduced to biomedical 'evidence' or cost-effectiveness data alone. Rather, findings from clinical epidemiology, economics, and complimentary modes of scientific inquiry established an exchange and biological use value for ITNs in an expanding market of global health

commodities. ITNs could then be 'sold' to donors as a proxy for lives saved, a good as easily marketed as a condom, and a material contribution to economic development. Donors' political preference for minimalist, market-based interventions constituted an additional desire for ITNs that exceeded the utilitarian function of the technology in curbing malaria. This political value, rooted partly in biomedicine, was not beside the point, but crucial to the uptake of ITNs in African health programs. Taking a biomedical commodity as its vehicle, this paper sheds new light on the interaction of epistemic communities and capital formations in global health and development.

The Political Machineries of Sanitary Pads as Pro-Poor Technologies: Between India and the World *Shobita Parthasarathy, University of Michigan*

This paper investigates the "political machineries" that have produced sanitary pads as a pro-poor technology in India. It examines the knowledge and expertise that produced sanitary pads as a technological solution to the problem of gender equity, and the values, logics, processes, and rules with which they are intertwined. The Indian sanitary pad story began around 2005, when public health and international development experts began to argue that girls were missing many days of school, and sometimes dropping out entirely, because they lacked both the education and effective material tools to capture blood flow during menstruation. Academic and NGO experts offered data that linked school absenteeism and health problems among girls to the lack of these tools. These experts also argued that girls and women were contracting illnesses because the materials that they used to manage menstrual flow were not hygienic. Despite multiple weaknesses in this data, there was enormous enthusiasm in this technological solution. Soon, international organizations provided grants to entrepreneurs, NGOs, and small businesses both inside India and around the world, to develop and distribute sanitary pads to poor women. Fueling the emerging market, by 2010 the Indian government had begun to provide highly subsidized sanitary pads to adolescent girls in rural areas. In this analysis, the paper investigates the politics of knowledge that underlie sanitary pads as a pro-poor technology, and also analyzes whether there are patterns in how either governmental and non-governmental, or international and Indian actors, approach the intervention.

White people's shit: incremental development and excremental politics *Adia Benton*

Recent studies of 'compassionate consumerism' have highlighted a growing trend in commercial -- as opposed to philanthropic -- development aid (Richey and Ponte 2011). These studies highlight generally criticize how such initiatives gloss global and regional inequalities and reproduce the mechanisms driving them, while also eliding some of the racial, economic, and socio-technical processes involved in inequalities' reproduction. In this paper, I present a case in which a US toilet company donates an 'innovative' hygienic toilet pan to developing world households for each of their 'efficient' toilets they sell in the US. Specifically, I look at nodes in this process -- US marketing strategies, communication about the toilet pan technology, and distribution mechanisms for the hygienic toilet pans to sites like Nigeria and Uganda -- to

interrogate the relationships among international development, branding, innovation, waste and excess. Specifically, I question the moral and political grammar structuring the presumed transformative potential of "white people's" waste, of its capacity to mediate hierarchies of value and exchange, abundance and excess in the name of conscious consumerism and international development.

Session Organizer:
Shobita Parthasarathy, University of Michigan
Discussant:
Richard Rottenburg, University of Halle

237. Time-Scapes of Toxicity (2): Time of Knowing
Papers for Open Panels/Time-spaces of toxicity
Open Panel
4:00 to 5:30 pm
ICC: E5.7

How does time play out in toxicity? While ideas of "the Anthropocene" and "slow disaster" urge consideration of hazards along much longer timeframes, the multiplicity and simultaneity of temporal scales—of humans, natures, and materials such as plastics, pesticides, or radiation—complicate the ways actors and researchers comprehend time within and across polluted sites. Time-scapes connect with land- and socio-scapes. On the one hand, acknowledgment of toxicity develops at different times in different regions, and industries strategically shift extraction and manufacturing to navigate costs and regulation. On the other hand, human actions bring about new openings and closures to toxicity – for instance, when actors reframe asbestos as a present-day environmental hazard, rather than occupational hazard "of the past" to mobilize attention and intervention. We welcome papers exploring questions such as: Where in time do actors locate risks, and what work does that do? Where are places located in relation to time-scapes of toxins? In what ways do actors make sense of temporal scales in polluted sites, and work to open and close problems of toxicity? How do temporal boundaries relate to efforts to manage hazards and enact safety? How does temporal locating of risk, shift public priorities or felt experiences of being "at risk" or safe? How do actors and could researchers comprehend a longue durée of hazards? By asking these questions, this panel contributes to the understanding of transnationality of knowledge production, technological inventions and usages, and regulation and activism about hazards – through thinking across temporal and spatial boundaries.

Participants:

Bodily time, material time: Battling with asbestos in South Korea *Yeonsil Kang, The Catholic University of Korea*
Battling with asbestos is battling with the time. Asbestos is one of the tenacious hazards around the world, as the industry finds its place where recognition of toxicity has not yet developed. While the banning the use of asbestos is important, it does not accomplish the battle. The used asbestos-containing materials in the buildings, cars, and ships, slowly, but continuously break down, causing secondary pollution. The long latency period of asbestos-related diseases makes the battle even more difficult, especially for the victims who need to build the causal relationship for any form of compensation. This paper analyzes South Korea's asbestos pollution and asbestos activism as a revealing case of multiple times of toxicity. On the one hand, bodily time was addressed by the victims. In court, in worker's compensation, and in environmental relief scheme, the process of proving victims' bodily harms for compensation was a continuous work of reconstructing the past. On the other hand, material time of asbestos was emphasized by the activists. Activists have argued the entanglement of temporal and spatial scales of asbestos pollution, throughout its lifetime from mining to disposal. In doing so, asbestos activists successfully redefined and expanded the toxic time of asbestos from past to future and the toxic space of asbestos from working space to living space. With asbestos pollution, multiple time-scapes of toxicity— bodily time, and material time—overlap with one another in South Korea.

Temporalities of Wildfire, Private-Equity, and Chemical Reaction in the 2014 WIPP-LANL Kitty Litter Accident *Vincent Ialenti, George Washington University*
Underground at the WIPP defense waste repository in New Mexico on Valentines Day 2014, a transuranic waste drum originally from Los Alamos National Laboratory (LANL) burst open—spitting out fire and radionuclides. There had been a chemical reaction in one of the 650+ LANL drums improperly packaged with organic Swheat Scoop kitty litter, rather than the recommended inorganic zeolite absorbent. This talk presents this error as symptomatic of the frenzied tempos of the 3706 campaign: an agreement between the U.S. DOE and the New Mexico Environment Department – spearheaded publically by NM Governor Martinez – to rapidly accelerate shipments, from LANL to WIPP, of nitrate salt waste drums perceived to be threatened by future wildfires. Hired to package the drums was EnergySolutions (ES): a private nuclear waste contractor expanding rapidly – through corporate buyouts backed financially by the private equity company Energy Capital Partners that owns it – across forty U.S. states, the UK, Canada, and Japan. Drawing on ten weeks of ethnographic fieldwork in Los Alamos and Carlsbad (2017-2018) – and inspired by STS and anthropological literatures on poly-temporality (e.g. Traweek 1992; Miyazaki 2003) – this talk explores how the tempos of a chemical reaction, of gubernatorial electoral politics, of wildfires, of DOE performance bonus schedules, and of private-equity financial pressures converged as triggers to the 2014 LANL drum breach. It then critiques the DOE's 2015 Accident Investigation Board's description of the event by emphasizing key political-temporal contexts sidelined in the DOE report.

The Regulatory and Legal Issues of the Humidifier Disinfectant Disaster in Korea *Sungook Hong, Seoul National University*
The humidifier disinfectant was invented as a way to easily maintain the humidity of apartments in Korea, which is exceptionally dry in winter. Humidifier disinfectants were first marketed in 1994 and sold until 2011, when it proved to be the cause of fatal lung disease. The executives of the company that made them were sentenced to imprisonment in 2017. As of 2018, more than 1,000 people have been killed by humidifier disinfectants. This paper will deal with the following two questions from an STS perspective. First, how could these deadly toxic products be sold through the strict regulatory framework? This paper will reveal the link between the structured secrecy of organizations and the regulatory failure. Second, what were the issues in civil and criminal trials over the toxicity of humidifier disinfectants? This paper will show that the legal credibility of

epidemiological and experimental evidence on the causal relationship between the humidifier disinfectant and the lung disease became increased between 2011 and 2017.

Statutes of Limitation and Subcellular Injury: Time and Knowledge Production in the Taiwan RCA Litigation *Hsin-Hsing Chen, Shih-Hsin University Graduate Institute for Social Transformation Studies*

An appeal court in Taiwan has ruled in November 2017 in favor of former workers of Radio Corporation of America (RCA) in their lawsuit against their employer and its foreign parent companies for health injuries caused by chemical exposure at the workplace. The court has adopted very progressive opinions on several vital legal issues that have been hampering legal actions of victims of industrial toxic exposure throughout the world: causation in mixed toxic exposure, standard of proof, burden of proof of the litigants, the "corporate veil" of transnational corporations, and so on. Especially relevant to the issue of time is its ruling that the defendant companies cannot use statutes of limitation as a defense. The court made this decision by taking into consideration a more sophisticated understanding of the current state of science, and the social process of knowledge production in science. It takes time, especially when the injury is on a subcellular scale, for health effects of a chronic exposure to manifest itself into diagnosable diseases, and further time for patients, doctors and scientists to become aware of the collective nature of such diseases. Withholding information held by the employer or polluter delays or prevents discovery of occupational and environmental disease, hence defendant companies who do so cannot use statutes of limitation as defense. This progressive ruling was resulted from persistent collective efforts of many people, including members of the STS community in Taiwan.

Session Organizers:
Yeonsil Kang, The Catholic University of Korea
Britt Dahlberg, Science History Institute
Chair:
Britt Dahlberg, Science History Institute

238. Digital Sexualities, Biomedical Practice, and Queer Realities: Culture + Identity
Papers for Open Panels/Digital sexualities, biomedical practice, and queer realities
Open Panel
4:00 to 5:30 pm
ICC: E5.8
Participants:

Dazzle camouflage and queer counter conduct *jessa lingel*
Visibility has long been fraught for queer folks: the same spaces (Abraham, 2009) and technologies (Gray, 2009; Hamer, 2003) that provide powerful sources of solidarity, community and recognition can easily transform into sites of surveillance, harassment and violence. Given tensions of wanting to be seen, but only by some and only some of the time, how have queers resisted, twisted and played with experiences of surveillance? Particularly in the context of the socio-technical, what practices of managed and staged visibility have emerged as forms of queer counter-conduct? Drawing on Simone Brown's theory of dazzle camouflage (2015), I discuss three modes of queer counter-conduct geared towards managing homophobic and transphobic surveillance: • Chelsea Manning's anti-

trolling on Twitter • online exchanges of shade and reading in drag communities • Zack Blas' mask exhibitions Across these examples, we see deliberate arrangements of technologies and bodies as a means of coping with forms of surveillance, and specifically a gaze that is trans- and homo-phobic. In her analysis of surveillance theory and black bodies, Brown describes dazzle camouflage as a set of counter-surveillance tactics that rely on optical confusion: "rather than concealing … dazzle camouflage was intended to make it difficult to visually assess size and speed by way of optical illusion" (p. 163). These themes of spectacle, display and avoidance have provocative implications for other marginalized groups, including queer and trans people. This paper situates different socio-technical modes of counter-conduct within the framework of dazzle camouflage as a way of drawing together surveillance studies and queer STS.

Queering Mobilities, Imagining Desire *Vishnupriya Das, University of Michigan*
This exploratory ethnographic study investigates how gay men use mobile mediated technologies to imagine and articulate erotic desire in Gurgaon, India. Despite the current criminalization of homosexuality in the country, public performances of queer identity in urban centers have continued to grow in visibility. For people with same sex desires, the proliferation of smartphones has made moving between multiple platforms such as Facebook, WhatsApp and geolocative dating apps integral to coordinating physical in-person social interaction with others who express similar desires. This raises questions about how Internet-enabled polymedia environments complicate ideas of mobility and what influence this might have on emerging queer spaces. Investigating the intersection of digital movement and physical bodies, I trace how attendees of Gurgaon's first Gay Pride Parade (2016) switch among multiple cellphone applications as they travel between home and the city they work in: Gurgaon, a tech hub to the south of India's capital that draws in migrants from across the country who have left small towns in search of better socioeconomic opportunities. Analyzing how mobility is simultaneously structured by the affordances of physical bodies (co-presence at the gay pride parade) and digital "bodies" (shifting among Facebook, WhatsApp and Grindr), I examine spatial and temporal dynamics in the use of cellphone applications to navigate queer interactions.

Queer encounters with D/deaf identities *Rebekah Cupitt, UCL Anthropology/City, University of London*
Deafness is sometimes defined clinically according to decibels, levels, and areas of brain activity. When being deaf is understood less as a lack of hearing ability and more in terms of ethnolinguistics, clinical definitions shift out of view, yet still remain in the background, informing cultural discussions on authenticity, legitimacy and belonging. When it comes to everyday practices of communication, specifically video meetings in the workplace, both clinical and non-clinical versions of being deaf are at play. Furthermore, definitions of what it means to be hearing are present and even challenged. Beginning with a discussion of how interactions between people and video meeting technologies play out in the workplace, this paper addresses technology's role in the labour of establishing multiple versions of deaf (and

hearing) identity in a particular moment. In doing so, it calls into question the general rhetoric of how technology enables (or "makes able") the so-called disabled deaf. Instead technologies (and hearing colleagues) become meaningful co-conspirators in moves to establish Deaf identities in the everyday organisational contexts.

Session Organizers:

Stephen Molldrem, The University of Michigan
Roderic Crooks, UCLA Department of Information Studies