Book of Abstracts

14th Annual STS Conference Graz 2015

Critical Issues in Science, Technology and Society Studies
11-12 May 2015

CONTENT

CT…Conference Theme
S… Special Session

Cancelled Session: S 8, S15, S16, S18

KEYNOTES

Gendered Representations of Sciences in the Media

Els Rommes
Radboud, Institute for Gender Studies, University Nijmegen, The Netherlands

One of the explanations for the low number of women in technosciences is the way sciences are depicted in the media. I will present research on which cultural imaginary of sciences and scientists have dominated the Dutch media aimed at youth in the past 20 years and in which ways this imaginary can be considered as gendered. In general, depictions of scientists in media like cartoons, television series, books and magazines follow stereotypes like the scientist as an older man, who does not pay attention to his looks. Through this depiction of a scientist and through other means, science as a profession is presented as something which is very difficult, dedicated, lonely work of which the usefulness can be doubted. Are there differences in this representation between fiction and non-fiction? And which processes are underlying this gendered representation of the sciences? How do e.g. television makers, fiction writers or directors of sketches on television make their choices in how they present science?

"The Household Junction": Households as Friction Zones in Infrastructure Transitions

Harald Rohracher
Department of Thematic Studies, Technology and Social Change, Linköping University, Sweden

Urban infrastructures such as electricity, heat and transport systems are becoming increasingly interdependent, particularly under the pressure of moving towards more efficient and sustainable configurations. Managing the coupling and interaction of these systems, however, is only to some extent happening at the technical level. Much more, these couplings depend on social practices and activities of infrastructure users in households. Households thus constitute a critical junction for the interlinkage of infrastructures as they are the sites for coordinating demand with – sometimes contradictory - requirements of managing the supply-side load of electricity, heat, electro-mobility and micro-generation.

The main aim of this presentation is to think and reconsider the transition, interlinkage and management of future urban infrastructures through the perspective of its users. The hypothesis is that the opportunities and tensions created at this junction of infrastructures are an important source of systemic innovation processes towards future infrastructures and at the same time link infrastructure change with broader socio-political and institutional questions: Are the requirements and capacities of monitoring and control coming along with some concepts of sustainable infrastructures moving us increasingly towards a 'surveillance society'? Are these new types of infrastructure creating new boundaries of inclusion and exclusion? Is the demand for active users and prosumers at the centre of many of these concepts a new way of enrolling and integrating users into corporate demands? Is the household at the same time a potential arena to resist, negotiate or reframe such requests? Speaking of households as an innovation junction thus not only relates to new socio-technical configurations to manage infrastructure integration (such as 'smart homes'), but also refers to households as a site of possible reframings and recontextualisation of infrastructure innovations.

"Social Sustainability Assessment Tools in the Early Planning of Refurbishment and Infill Development in Finland"
Simon le Roux
Aalto University School of Arts, Design and Architecture, Department of Architecture, Espoo, Finland

Urban regeneration is a key strategic measure for European sustainability. Targets for the social dimension of sustainability are loosely defined and tools for participatory design are constantly developing. In 2014 Finnish architecture students made design proposals for infill development based on municipal sustainability strategies and assessment tools for communal involvement. Design work was supported by research to develop user and business-oriented renovation concepts for the refurbishment and extension of suburban apartment buildings. Design proposals were assessed according to a standardized framework for the social performance in in design and planning of construction works, for insight into their relevance for stakeholders at different levels of assessment. The focus on participatory design highlighted residents' opinions, visions, different needs of age groups and social impacts of built environments. Stakeholder participative methods included interviews, workshops, on-site analysis, and interactive tools with websites, social media and GIS. Findings were associated with specific locations, services and infrastructures, and were structured in more concrete terms than the abstract categories in the standardized assessment of social performance in buildings. Assessments are specific to the functional unit of buildings, but the overarching principles of sustainability pertain to spatial, temporal, material and social interrelations. Principles are applicable on different scales, but design decisions are a contextual synthesis of observations and trade-offs between priorities in problem solving. The process and implementation of design is complex and based on numerous drivers and interests.

„Responsible Research & Innovation": Meeting Societal Challenges as a Challenge to Science and Technology?
Daniel Barben
Institute of Science, Technology & Society Studies, Alpen-Adria-Universität Klagenfurt, Austria

In past decades, "global challenges" or "grand societal challenges" have become key concerns in the discourses on global change and governance. In this talk, I will elaborate on how in these discourses science and technology have been portrayed as providing solutions to global problems but, increasingly, have also been criticized for only carrying limited problem-solving capacity. Moreover, science and technology themselves have been addressed again and again as bringing about challenges to society which would require serious attention and care. Hereby, the ways in which science and technology are generated, regulated, applied and appropriated have become an issue, thus concerning researchers and innovators, decision makers in government and industry, as well as civil society organizations and citizens alike. "Responsible research and innovation" (RRI) can be considered the most recent major attempt at exploring and supporting novel configurations of research and technology development which, through inclusion of interdisciplinary and transdisciplinary formats (i.e., by including the social sciences and humanities and forms of public engagement, respectively), should be better able to meet societal challenges and, at the same time, provide both better innovations and improved societal legitimacy. In consequence, a critical question regarding the prospect of RRI will be to what extent it may strengthen science and technology – or: empower scientists and engineers – or rather undermine the foundations of their power and self-understanding.

CT: Bodies, Health and Technology

S1 (1): Intimate Technologies: Embodying Artefacts, Remaking Bodies, Enacting Norms

Chairs: *Lucie Dalibert & Marjolein de Boer*, Maastricht University, The Netherlands

Facial Protheses and the Promise of Passing
Gili Yaron, Department of Health, Ethics & Society, Maastricht University, The Netherlands

When going out in public, people with facial disfigurement face various responses to their unusual appearance (Landsown 1997). Such 'double takes', staring gazes, questions and remarks by strangers have the effect of marking facially disfigured people as conspicuous, and indeed as 'different'. This may result in an unwanted loss of anonymity (Garland-Thomson, 2011). Anticipating these responses, many people set out to conceal their facial difference and thereby 'pass' as normal. In my talk, I will examine the place of facial prostheses within such everyday 'passing' practices. A facial prosthesis is a silicone artefact worn by people who have lost one or more facial limbs, and that covers and conceals their disfigurement. By (seemingly) offering a technological solution to the problem of unwanted obtrusiveness due to facial difference, the prosthesis in fact harbours what I would call a 'promise of passing'. But how does this promise unfold in everyday life? In order to answer this question, I will analyse the stories of people who wear facial prostheses. As these stories reveal, the act of donning a facial prosthesis engenders continuous efforts to achieve a good fit, as wearers mind, tinker with and plan around their prosthetic faces. And in spite of these efforts, successful 'passing' is not guaranteed. The prosthesis, it turns out, is by no means a quick fix: using it to 'pass' requires much care and brings along many cares. Wearing a facial prosthesis thus produces a particular, normative relationship to one's sensed and observable face, which both appear phenomenologically in the wearing.

It's Like a Siamese Twin around Your Neck – Patients` Accounts of Living with Ventricular Assist Devices (VADs)
Holly Standing, Catherine Exley, Tim Rapley, Institute of Health & Society, Newcastle University
Guy MacGowan, Freeman Hospital, Newcastle upon Tyne, United Kingdom

Declines in the number of donor hearts available for transplantation have led to an increase in the use of ventricular assist devices (VADs) as a bridge to transplantation. VADs are mechanical circulatory devices which support or replace the function of a failing heart. The VAD is located both within and outside of the recipient's body. Whilst the pump aspect of the device is internal, there are external components including batteries and a controller, these are permanently connected to the body via a driveline. Life, following the VAD implantation becomes intimately linked with technology; recipients must learn to become essentially dependent upon the device to live and accept the technology as something which is intimately connected to them. The 'not-self' (Jackson, 2002) becomes intimately entangled with the 'self'. This entanglement with the 'not-self' causes the patient's body to dys-appear (Leder, 1990), bringing it back to consciousness. It also alters recipient's perceptions of their surroundings causing previously innocuous objects, such as door handles, to become threats to safety due to the materiality of the VAD. Work is required to adapt the materiality of the VAD into the choreography of everyday life to protect it (and hence them) from damage. Patients must learn to re-inhabit both their own

changed body, routines, and physical environment, and establish a coherence between the practices of caring for the 'self' and the 'not-self'. This paper explores how patients make sense of their new bodies, the mix of 'self' and 'not-self' and impacts on their identities and surroundings.

Doing Dis/Ability and the Embodiment of Artificial Legs – Everyday Life Stories of German Prosthetic Users
Carolin Ruther, Department of European Ethnology, Augsburg University, Germany

At present there is a growing media and academic fascination with users of prosthetic limbs. This is mostly accompanied by vivid debates on the meanings of disability, bodily normality and the role of technology as a human enhancement strategy. Some scholars suggest that the current developments in high-tech prosthetics will blur the boundaries between man and machine. But: To which degree do these (new) images and interpretations – of impaired bodies, disability, technology, and identity – have their basis in the everyday life experience of prosthetic limb users? How do amputees integrate prosthetic limbs into their body image and sense of self? And how does materiality generate meanings of bodily impairment and dis/ability in the lives of prostheses users?

The proposed talk addresses these and other questions. The preliminary findings are part of my current PhD project. Using the example of prosthetic leg users in Germany my (ethnographic) research explores everyday constructions of dis/ability and the interactions between body and technology; what interests me the most is how assistive technology can influence ideas about the body, self and dis/ability. Theoretically, I draw on framework from Disability Studies, Medical Anthropology, and Science and Technology Studies.

Affected Bodies and Adjusted Bike: Finding the Perfect Fit on a Bike and Imagined Trail
Robin Rae, Department of European Ethnology, University of Vienna, Austria

The increasing importance of leisure activities, of having fun, of getting or staying fit, and exploring nature, is suggested by the media and a plethora of highly technologized and diversified artefacts as found in mountain biking. Driven by constant innovation, changes in bike technology indicate how meaningful yet re-/negotiable the relation of body and bike can be and matter for subjectivities, if (even) a slight increase in wheel size can cause heated controversies. My ongoing PhD investigates how riders' experiences of body, bike, and landscape are trans-/formed in practice by changes in bike technology.

From a multi-sited ethnography in California – spanning bike trails, shops, and companies – I present an encounter with so-called bike-fitting done in a shop, and taught at a company. In this process of first assessing the body and then adjusting a bike-setup, an array of artefacts and imaginations is mobilized to obtain an individually yet temporally ideal posture for healthy and/or efficient cycling. By delving into empirical material I explore how and what bodies emerge through being affected by differences in and beyond this setting, how intimacy of the situation is enacted, and how it matters for the re-/negotiation of bike-body relations?

S 1 (2): INTIMATE TECHNOLOGIES: EMBODYING ARTEFACTS, REMAKING BODIES, ENACTING NORMS

Chair: *Gili Yaron*, Department of Health, Ethics & Society, Maastricht University

Doing Embodiment and Incorporation, Living with Spinal Cord Stimulation
Lucie Dalibert, Department of Health, Ethics and Society, Maastricht University, The Netherlands

Seen as contributing to human enhancement, implanted technologies have recently been receiving a lot of attention. Reflections on these technologies have however taken the shape of rather speculative ethical judgments on 'hyped' technological devices (such as brain-computer interfaces and deep brain stimulation), thereby neglecting more mundane implanted technologies.

In this presentation, while relying upon the fieldwork I undertook with spinal cord stimulation, I will attend to the ways in which this neuromodulation technology not only transform bodies and experiences of the world, but also how it brings forth the material and relational dimensions of one's existence and is dependent on norms about what and who counts as human. I will do so by focussing on the processes of embodiment and incorporation.

To live with spinal cord stimulation, a learning – groping – process is necessary. The body is here mobilized so that the technology can be embodied, that is, experienced transparently at the sensory-kinetic level. If embodiment is a necessary process, it is not sufficient for spinal cord stimulation to be lived satisfactorily. For this, one needs to (successfully) identify with one's technologically modified body. In this incorporation process that is visual as well as tactile and emotional, the bodies of others – close or further ones, loved or unknown ones – is central. Social norms are also critical: injunctions related to femininity, masculinity, able-bodiedness and youthfulness are as many elements that matter for one's ability to incorporate and live satisfactorily with spinal cord stimulation.

The Scripted Breast: Affective Bodily Engagements with Medical Devices and Prosthetic Objects in Breast Cancer
Marjolein de Boer, Department of Health, Ethics and Society, Maastricht University, The Netherlands

Women who have (had) breast cancer relate to, interact with, and to some extent incorporate various medical devices and prosthetic objects. These objects contain scripts: they attribute and delegate certain competencies, actions and normative structures to its users. In this presentation, I will explore how such scripted objects play a role in the construction and transformation of bodily experiences of women-users who have (had) breast cancer. In turn, I will examine how these women-users actively reconstitute their embodied experiences by 'playing' and negotiating with scripted objects. By drawing on different kinds of empirical material (blogs, in-depth interviews), I will discuss three cases of actively (re-)scripted bodily experiences: 1) Dealing with the painful mammography, 2) Customizing the pirate bra and 3) Wearing the pink prostheses. On the one hand, these cases show how medical devices and prosthetic objects involved in breast cancer prescribe specific norms of sickness, raciality and femininity, and how such scripted norms affect women's embodied experience at various levels (looks, felt sensations, capability, stamina, etc.). On the other hand, these cases also reveal that in their embodied engagements with medical devices and prostheses, women actively navigate – reject, transform and replace - these scripts, thereby actively reconstituting their embodied experiences. As such, the discussed cases disrupt any

understanding of the use of (medical, prosthetic) objects as a one-way street in which its scripted norms are inscribed onto the bodies of its users. Rather, this presentation brings into view how scripted objects both shape and are shaped by its users.

Bodily Openness and Body Modification: A Phenomenological Reading of the Habitualization of Titanium Implants
Sara Rodrigues, Social & Political Thought, York University, Toronto, Canada

A "microdermal" is a body piercing in which a titanium anchor, implanted into the flesh, secures a titanium disc atop the flesh. This paper offers a phenomenology of the embodied experience of microdermal implants, a type of body modification dependent upon the fusion of flesh with titanium. Scholars have examined body modification as a form of culturally and historically contingent production of identity (Sullivan 2001; Pitts 2003), but few thinkers have explored how the incorporation of metal into flesh is lived, experienced, and embodied. Drawing on my first-hand experience living with microdermals, this paper explores how these implants (re)shape embodiment through the production of myriad affects as well as the (re)articulation of bodily habit, aesthetic, and schema (Merleau-Ponty 2013). What sensations and embodied adaptations do microdermals galvanize? How do such modifications queer the phenomenology of embodiment? This paper will show how microdermals—which the body treats as an open wound—create an "openness" in the body, directing it towards new and shifting sensory possibilities as well as corporeal vulnerabilities, both of which require continued attention and re-habitualization. Empirically, I draw on a journal wherein I account for my bodily sensations and my relations to other bodies and with health care practitioners. Analytically, I situate body modification at the intersection of habit, sensation, and the incorporation of technology in order to think through how body modification makes embodiment a flexible, contingent, and, in turn, open phenomenon. Overall, I will argue that body modification generates an "open embodiment" that forces a relearning of the world, a rearticulation of embodied doing, and a renewal of embodied possibility.

Being a Quantified Self: An Examination of the Discourses and Practices of the London Quantified Self Group
Ana Viseu, ISCTE-IUL, Lisbon, Portugal

Founded by two influential technolibertarians from Wired magazine, the 'Quantified Self' (QS) movement is a growing international grassroots movement. Its members are a mixed bunch of people who develop and use technoscientific devices (tools and software) to monitor and quantify their bodies. The data they generate is expected to provide them with a more objective form of self-knowledge, a scientific self-awareness, that will then help them optimize self-performance. Underlying this movement is the belief that technoscience will work to 'naturally' reconnect the knowing and acting body (Viseu & Suchman 2010). The QS movement materializes and is driven by (at least) two complementary trends in contemporary Western societies: a scientific paradigm that has seen the exponential growth in data sets (Nature 2008; McFedries 2011), and a desire to blur the boundaries between online, offline, physical and virtual by augmenting the world of matter with computational devices (Viseu 2003a; Mitchell 1999). This paper presents preliminary results of two ongoing and complementary studies - a study of the design and implementation of wearable computing to reflect upon the experiences of users and the visions of designers, and interviews with members of the QS London group - to trace the practices and discourses of QS London members, and examine the shared imaginaries that drive and justify this movement.

S2: MHEALTH AND SURVEILLANCE: CARING FOR DATA?

Chairs: *Maartje G.H. Niezen & Tjerk Timan*, Tilburg Institute for Law, Technology and Society (TILT),
University of Tilburg, The Netherlands

Telecare Technologies and Self-Management of Chronic Patients

Ivo Maathuis, Department of Science, Technology and Policy Studies (STePS), University of Tilburg,
The Netherlands|

Telecare technologies are instruments that enable care at a distance via the use of information and communication technologies (ICTs). One of the aims of telecare technologies is to support self-management strategies of chronic patients. However, the ways in which self-management is articulated in the design and use of these new technologies is largely unaddressed. This research focusses on how telecare technologies participate in enabling and/or constraining self-management practices of chronic patients by questioning what forms of self-management are inscribed and enacted in design and use practices of a contemporary telecare technology for COPD patients. The research illustrates that telecare technologies participate differently in supporting self-management practices of chronic patients. Some patients develop adequate practices in living with their disease with the incorporation of a compliant form of self-management in the telecare technology, which includes a strict regime of technologically mediated surveillance. Others thrive better with a telecare system that supports a more autonomous form of self-management, including less strict medical surveillance regimes. In order to develop a successful and morally acceptable technology that enables care at a distance, the research therefore suggests incorporating flexible scripts supporting various forms of self-management into the design of telecare technologies, including the integration of experience based knowledge of patients and sufficient means for communication and education. Patients and doctors should engage in a process of 'shared decision making' to decide which script is most suitable to develop adequate self-management practices.

The Quantified Human: On the Digitalisation of Measuring Illness and the Body

Stans van Egmond & Marjolijn Heerings, Rathenau Institute, Department of Technology Assessment, The Hague, The Netherlands

We humans are increasingly able to quantify, measure, monitor bodily functions closer to and in the body, with cheaper, mobile, quicker and invasive devices. Combining DNA and imaging data with data from biological samples, medical records and lifestyle data on patients and consumers, leads to promises of personalized medicine. These developments allow new actors access into research and therapy, and empower individuals in maintaining a good health or in living with disease.

However, there is also a strong link between selfreporting by patients and the need for big data in biomedical research. Big data has become paramount for the advance of biomedical research. Some of these data comes from the field of selfmanagement, for example from patiens with diabetes type I and II, rheumatic arthritis and other. Hence, for biomedical research to advance, input from patients is needed based on selfreports, and given freely. This, however, creates tensions in several areas: the work that is done for measuring does not always benefit those who measure, the goals of measuring may vary per actor and do not always improve care or health. We address these tensions drawing on empirical descriptions of quantification practices from nine empirical cases.

mHealth as a Neo-Liberal Technique
Mona Urban, Institute for Public Health und Pflegeforschung (IPP), University of Bremen, Germany

The use of mobile sensors and devices that track (patient) health data and transmit them to call centers, web sides, clinicians or caregivers is highly attractive for most actors in the health care system. First of all, the health care market, pharmaceutical industry as well as public health institutions profit from their usage. Furthermore, a wide range of health care products and services emerged by reason of health data. In this vein, the arrival of mHealth initiatives by health insurance companies also comes as no surprise, because they are linked to the imperative to reduce costs by optimizing clientele. Last but not least, millions of mHealth users have punchy reasons why they *love* to produce and to spread data.

Primarily, this willingness to produce and to spread date can be interpreted as a direct effect of the responsibilisation of the subjects in post-welfare states. The *duty to be well* (Greco) has become a daily performance of the *enterprising self* (Bröckling), who is optimizing his or her position on the diverse markets. This omnipresent competition is performed by relating individual data to the data of others. Secondly, the reduction of the public health care services enforces *home based care* for a broad range of people with handicaps or (critical) conditions. mHealth, thus, facilitates privately financed nursing in advanced liberal societies.

A discourse analyses, focusing on the visibilities through eHealth, and, linked to that, the hegemonialisation of knowledge and the processes of subjectivation, can offer a profound reconstruction.

Unobtrusiveness and Surveillance in mHealth Applications
Maartje G.H. Niezen & Tjerk Timan, Tilburg Institute for Law, Technology and Society (TILT), University of Tilburg, The Netherlands

mHealth is an emerging and rapidly developing field that promises to increase access to care at lower costs and with greater acceptance than traditional healthcare environments currently can. The increased acceptance of mHealth over eHealth or regular care is often related to the diminished obtrusiveness of the device monitoring, coaching, diagnosing, and / or collecting data of its user. However, unobtrusiveness not only has gains, but might also come at a cost. Although one should be careful not to mistake mHealth monitoring for surveillance, the border between unobtrusive monitoring via mHealth and surveillance is not as clear cut as might be suggested. The unobtrusive character of certain mHealth devices, specifically smartphones, have contributed to the increasing ubiquity of surveillance technologies in everyday life. In many mobile health applications users simply have less control of the information they supply and receive as well as the way it will be used. The Orwellian Big Brother looms at the corner when the gathered data is not only used for the joint enterprise of enabling a person to live healthier but for other purposes too. This leads to critical questions such as: whether and how users should be informed about the trade-off they make between unobtrusive monitoring or coaching via mHealth and potential infringement of privacy, loss of autonomy and will-power. Importantly, exploring the relation between unobtrusiveness and surveillance in mHealth demonstrates how people's practices and expectations with respect to privacy and autonomy change in their interaction with the mHealth technology.

S3 (1): EMERGING CONFIGURATIONS OF BIOMEDICAL TECHNOLOGIES

Chairs: *Manuela Perrotta*, Queen Mary University of London, United Kingdom
        Lilla Vicsek, Corvinus University of Budapest, Hungary

Political Belonging and the Governance of Reproductive Technologies
Daniela Schuh, Department of Science and Technology Studies, University of Vienna, Austria

In recent years there has been a growing debate concerning children born from transnational surrogacy and how conflicting national legislations can lead to a legal limbo which leaves children in uncertainty with respect to guardianship and nationality. This paper focuses on transnational surrogacy with a particular interest in challenges posed to citizenship as technology of state-building in our globalized, technoscientific world. Anchored in a particular geographic and political community, citizenship encompasses individual rights and duties in relation to the state but also evokes notions of belonging, national identity, sovereignty, and control. It will reflect on how scientific insights and technological developments in the area of human reproduction, on the one hand, and citizenship in all its dimensions, on the other are co-produced. These reflections will be illustrated by turning towards France's legal struggle over the nationality of children who were denied French citizenship due to their birth by cross-border surrogacy. I will further compare this "French" approach with the approaches taken in other European States and elaborate on the attempt of harmonizing legislations within Europe on this matter. In its theoretical approach, my paper offers a co-productionist analysis of this case, drawing also on concepts such as "bioconstitutionalism" and "sociotechnical imaginaries" as introduced by Sheila Jasanoff and fellow writers. Aspiring toward a better understanding for the ways in which desires and visions of collective social order are bound up with attempts to govern citizens' engagement with technological practices in a globalized setting, I also draw attention to lawmaking and adjudication as powerful institutions that enact and reproduce elements of prevailing national imaginaries.

Assisted Reproductive Technologies on Trial
Anna Pichelstorfer, Department of Science and Technology Studies, University of Vienna, Austria

Although assisted reproductive technologies (ART) are increasingly 'globalized', comparative STS studies have shown that the practices as well as values attached to them vary greatly among different nations.

The Austrian reproductive medicine act, which is currently changed, can be described as very restrictive but also as rather unique in terms of technologies permitted. It has been challenged in different practices, e.g. in reproductive tourism or the establishment of fertility clinics in neighbouring countries. Nonetheless, there was hardly any public debate or a change of law in the past 30 years. It was only due to legal disputes that ART became topic of modification.

In order to better understand the work involved in enacting seemingly globalized practices and knowledges very differently in local contexts I analyse Austrian versions of (assisted) reproduction. This paper, which is based on empirical data gathered for my PhD project on the renegotiations of the Austrian regulation on ART, analyses two legal disputes at the European Courts of Human Rights and at the Constitutional Court of Austria. Both cases provide excellent examples to make visible how specific Austrian enactments of ART (e.g. differences drawn between natural and artificial modes of reproduction) are coproduced with rights and responsibilities of the state

and its citizens as well as moral regimes to value and evaluate them. In my analysis I pay particular attention to the ways how the law is enacted as a context in which locally specific configurations of biomedical technologies can emerge.

"The goal is to have a baby and you put all other things aside" -Ethical frames in the decision-making about embryos among Hungarian IVF patients

Lilla Vicsek, Institute of Sociology and Social Policy, Corvinus University of Budapest, Hungary

Since the first baby has been born as a result of in vitro fertilization (IVF) in 1978, millions of babies have been born worldwide with this method. There are great differences between countries in the techno-political culture of IVF. A relevant aspect of a society's IVF culture is how the embryo is viewed, and what ethical frameworks are used in the decision-making with about embryos. In an era where delegated biopolitics characterizes many societies, there is a range of decisions that patients can make, - or regarding which they at least have some say in - which concern the fate of their embryos. Most previous research on how the embryo is viewed and the ethics involved, focused on countries where debates on the moral status of the embryos featured prominently in the public sphere. The current research investigates this issue in Hungary, where there is basically an absence of such a public debate. As part of the *Infertility and the practice of assisted reproductive technologies* research project, which is supported by the Hungarian Scientific Research Fund and the Hungarian Academy of Sciences, I focus especially on what ethical frames emerge and how in IVF patients' accounts of their decision-making on non-transferred embryos. Semi-structured interviews were applied to examine the research questions. Preliminary research results indicate that although interviewed patients relied on other ethical frames as well, the dominant ethical framework in their accounts was the therapeutical ethics frame.

Awakening Lay Expertise and the Changing Doctor-Patient Relationship in Hungary

Zsófia Bauer, Hungarian Academy of Sciences, Centre for Social Sciences, Corvinus University of Budapest, Hungary

Present paper (funded by OTKA-K108981) investigates everyday life experiences of infertile women who have decided to seek medical treatments which employ assisted reproductive technologies (grounded in a volatile relationship with the health care facilities), based on a systematic and in-depth qualitative analysis of topic related on-line discussion group messages.

The research focuses on the special knowledge and expertise patients obtain throughout the course of their often long and emotionally taxing treatments, becoming the archetype of lay experts. The study examines how this contextual knowledge is used in cooperation with medical professionals, or at times leveraged against them through the course of infertility treatment. Growing patient knowledge has potential to affect the fundamentals of medical practice.

Hungary provides unique techno-political context for exploration, since it is traditionally a field where trust towards medical professionals and institutionalized medicine is typically low and social discourse on moral and societal impacts of biomedical and intimate technologies is very limited.

The chosen research design permitted studying the discourse of the participants in a natural, non-controlled environment, where the presence of the researcher had no influence on the results.

Main findings suggest that while lay expertise and condition based knowledge is rising, the supremacy of trust towards medical professionals and institutionalized medicine is fading in Hungary and a new dynamics in attitudes towards treatments is emerging as we speak.

"ICSI for all!": How an Unnecessary Biomedical Technology Became the Standard
Manuela Perrotta, School of Business & Management, Queen Mary University of London, United Kingdom

My contribution aims at looking the emergence of a "new technique" in the field of assisted reproductive technologies (ART). Although currently ART is universally known as IVF (In Vitro Fertilization), exploring it inside laboratories allows to see how the more used technique is nowadays ICSI (Intracytoplasmic Sperm Injection). ICSI was introduced as a solution to severe male infertility problems and as a possible alternative to the donation from third party donors. By using a single spermatozoa, ICSI permits the fertilization of an oocyte even in severe cases of male infertility. Since its introduction, the percentage of use of ICSI has dramatically increased. International data show that ICSI is currently used most often. Despite several professional opinion leaders in the ART field have recently criticized the overuse of ICSI, its success continues unabated.

The progressive passage from the old to the new technique is entangled into a controversial technology and tied to knowledge processes. The configuration of ICSI emerges from a network of organizational practices, which are embedded in an institutional setting and a moral landscape. My paper will explore several factors (organizational, social and moral aspects) that explain the disproportionate use of ICSI in the case of Italy.

S3 (2): EMERGING CONFIGURATIONS OF BIOMEDICAL TECHNOLOGIES

Chairs: *Manuela Perrotta*, Queen Mary University of London, United Kingdom
         Lilla Vicsek, Corvinus University of Budapest, Hungary

Desirable Bodies/Precarious Laborers: the Subjectivation of the Egg Donors in Ukraine
Polina Vlasenko, Indiana University, Bloomington, USA

As one of the few countries in Europe that endorses the commodification of donor egg cells, Ukraine becomes a popular destination for couples that seek conception. These transnational ova donation arrangements generate traffic in human gametes and medical migrants and lead to uneven use of reproductive technologies across borders. The scholarly consideration of the politics of ova-donation in Ukraine is particularly important since it indicates the colonization of the new reproductive markets and biologically available populations in the post-Soviet states. In this paper I analyze the discourses of egg donors, donor recruitment agencies and infertility clinics in Ukraine to examine how biopower constructs the subjects of egg donors along the lines of race, gender and class and enacts the frames of recognition that render their re/productive clinical labor precarious. The production of the bodies of egg donors as "desirable" to international recipients is accompanied by the persistent erasure of the labor that these bodies perform since it doesn't comply with the motherhood mandate for women. Moreover, my research takes into account different ways in which egg donors exercise their agency in making use of ova donation as a source of profit and participate in certain local and global economic arrangements.

Hybrid Configurations of Umbilical Cord Blood Banking in Europe
Beltrame Lorenzo, IAS-STS, Graz, Austria

Biobanks are crucial technologies in modern biomedicine, since they make available samples and bioinformation to researcher and clinicians. There are several biobanking models, differently organized, inspired by opposing ethics and varyingly involved in the economic exploitation of the surplus value extracted from the biological. This paper focuses on the case of umbilical cord blood (UCB) banking, which is organized in two main models: a public system managing the supply of UCB units for transplantation and a private sector offering to families the opportunity to store UCB for private uses. The two models are deemed as based on different ethics and entailing opposing values and economic logics: the public system is based on altruistic donation, promotes social solidarity and works in the framework of redistributive economy; private banking is running for profit, is built on self-interest and fosters a market economy of biomedical services. This paper analyzes the different national responses in regulating UCB banking vis-à-vis the setting of international rules, standards and protocols for harmonizing national regulations and enabling the global exchange of UCB units for transplants. Focusing on the case of some European countries (the UK, Germany, Italy, France, Spain and Austria), the paper shows how different configurations of this biomedical technology emerge from the interrelation between technical, ethical, economic and logistical considerations. The aim is to show how these configurations are evolving toward hybrid UCB banking models blurring the distinction between the market and the state and thus the related ethical and societal implications.

Configuring and deliberating personalised medicine in expert and citizen dialogues
Claudia G. Schwarz, Open Science – Lebenswissenschaften im Dialog, Vienna, Austria

The term "personalised medicine" (PM) is generally used as a buzzword for future trends in biomedicine today. More narrowly, it refers to strategies of stratification that divide patients into subgroups based on specific biomarkers to prescribe more tailor-made, effective therapies. But PM is also hailed to encompass proactive, predictive and post-treatment healthcare approaches. Thus, PM is still a largely contested term. Additionally, critical issues concerning the technical realisation of PM, its costs or data protection aspects are up for debate. Since patients and citizens are called upon to make their biological tissue and genetic data available for research purposes, public participation is considered necessary to realise the vision of PM on the EU as well as national level.

The paper reflects on an ongoing participation project that seeks to stimulate deliberation on PM among Austrian experts and citizens. It analyses how experts from a variety of backgrounds (research, medicine, industry, ethics, and regulation) discussed the current framework conditions, expectations and challenges in three stakeholder workshops, and compares these results with the ways in which members of the "lay" public debated the term PM as well as the issues of prevention, costs and data contribution in four citizen dialogue events. These dialogue processes not only represented venues to engage with current configurations of PM but also contributed themselves to the continuing configuration of PM in the Austrian techno-political context. The paper focuses on a comparison of how experts and citizen converge and diverge in configuring PM and in relating to existing configurations

Caring for Evidence. Research and Care in Bariatric Surgery
Michael Penkler, Kay Felder, Ulrike Felt, Department of Science and Technology Studies,
University of Vienna, Austria

The recent years have witnessed an impressive increase in bariatric surgery rates and gastric banding and bypasses have become prevalent methods in treating morbid obesity. Despite being the only treatments with measurable long-term weight-loss rates, surgical interventions are often faced with scepticism from within and outside medicine. This scepticism towards what is often conceived as an objectifying 'technical fix' is part of larger debates in biomedicine. As a technological intervention, these procedures build on highly standardized practices that are in tension with an increasing demand for patient-centred and diversity-sensitive care. Drawing on an ethnographic study of a clinical research project for the pre- and after-care of bariatric patients, we investigate how these tensions are addressed within clinical work and evidentiary research practices. In doing so, we relate to on-going discussions within STS in regard to questions of evidence-based medicine, standardization and objectification.

CT: Responsible Research and Innovation Studies

S4 (1): Responsible Research and Innovation

Chairs: Erich *Griessler*, Institute for Advanced Studies, Vienna; *Erich Polt*, Joanneum Research, Vienna; *Bernhard Wieser*, STS / IFZ, Graz, Austria

Research and Innovation Studies
Katharina Handler, Maria Schrammel, Margit Hofer, Centre for Social Innovation (ZSI), Vienna, Austria

Throughout history science and technology have proven to be transformative forces. Research and innovation have changed our world and our lives, and will continue to do so. The European-wide approach in Horizon 2020 called *Responsible Research and Innovation (RRI)* seeks to bring issues related to research and innovation into the open. The aim is to anticipate the consequences of research and innovation and to involve society in discussing how science and technology can help create the kind of world and the kind of society we want for future generations to come. But how can the heterogeneous stakeholder groups, such as industry, policy makers, researchers, civil society organizations or educators adopt the concept of RRI? What is an effective way to involve stakeholder groups into the RRI processes?

The RRI-Tools project will develop and deploy a training and dissemination toolkit on RRI. It will be addressed and designed by the above mentioned stakeholder groups. As a first step the term RRI has been clarified, taken into account the different approaches and discussions. In a second step, workshops with representatives of each stakeholder group were conducted in 19 different European countries aiming to identify their versatile thoughts, feelings and interests.

The session will discuss the challenge of reconciling these various interests, needs and constraints as well as opportunities and obstacles of RRI based on the analysis of the described workshops. The results will be

accentuated and advanced with gathered experiences in chosen Austrian RRI best practice examples. http://www.rri-tools.eu

Responsibility in RRI

Sara Vermeulen, Athena Institute, VU Amsterdam University, The Netherlands

Responsible Research and Innovation (RRI) is currently not only a much debated topic in innovation and policy studies but also a cross-cutting concept in EU's funding program Horizon 2020. It entails doing science and innovation with society and for society, including the involvement of society 'very upstream' in the processes of research and innovation to align their outcomes with the values of society. Responsibility is then not seen as a duty at individual level, but as a collaborative endeavor between all stakeholders in RRI practices. But how responsibility should be understood in relation to the notion of RRI is a - to large extent - unanswered but significant question.

In this presentation we will highlight outcomes of our FP7 RRI Tools project (http://www.rri-tools.eu), for which we collected and analysed promising RRI practices throughout Europe. Through our data analysis, we tried to uncover how we should design solid processes and outcomes in the light of this new and shared responsibility. This includes ethical, legal, governance aspects and beyond.

Furthermore, we will discuss how our understanding of the way in which responsibility is framed and valued has evolved. Finally, we will introduce criteria to design and evaluate responsible practices for research and innovation and discuss how we developed these criteria. By combining literature study with empirical data, we aim to create a better comprehension of responsibility and how to design research and innovation practices in such ways that they contribute to healthier science and better societies.

Promises and Challenges of RRI Governance: Transversal Lessons

Erich Griessler, Alexander Lang, Institute for Advanced Studies, Department of Sociology, Vienna, Austria

The concept of Responsible Research and Innovation (RRI) and related initiatives of governance are relatively new. Nevertheless, evidence from different fields of research and innovation already shows promising ways of RRI governance, but also obstacles, challenges and side effects. The paper analyzes several governance instruments and processes which have the potential to promote responsibility in R&I as well as their impediments and side effects. It compares three cases from Austria and Germany, in which actors from government, research, and industry use different instruments (e.g., environmental impact assessment, ethics committees, interdisciplinary research, engagement of a critical public) in three areas of research and innovation (general basic research, biomedicine, fracking for shale gas) to promote different aspects of RRI. The paper will provide an overview of the attempts to promote RRI in these cases and the governance instruments and procedures applied therein. Its main focus lies in cross-case comparison and lessons for RRI governance. It will be argued, that the success of RRI governance might be closely linked to issues of effective communication; the existence of communication fora; issues of framing, values, and boundary setting as well as deep institutional change. The research was funded by the European Commission within the 7th Framework Programme and conducted in the Res-AGorA project; http://www.res-agora.eu.

From ELSA to RRI: Reframing the Social Studies of Science and Technology
Bernhard Wieser, STS/IFZ, Graz, Austria

This paper aims at exploring the conceptual shift in the social studies of Science and Technology. Two main regimes will be discussed: 1) ELSA as a framework designed for the integration of ethical, legal and social aspects in genome research, and 2) RRI as a new framework promoted by the European Commission in order to provide a new funding for the social studies of science and technology. The paper will address opportunities for future research as well as constraints produced through RRI.

RRI: A Radical Innovation?
Michael Ornetzeder, Institute of Technology Assessment, Austrian Academy of Sciences, Vienna, Austria

In this presentation RRI is treated as a radical innovation. Drawing on concepts of institutional innovation and transition research relevant conditions for the success of RRI as radical innovation will be discussed. Taking this perspective, RRI appears as a novel approach aiming at a fundamental change of present innovation regimes. Based on core requirements of RRI this envisioned new regime should be able to deal better with the grand societal challenges of the 21st Century without neglecting possible negative side effects of emerging technologies. However, RRI still is in a very early stage of development; a stage that can be characterised by conceptual variation, limited actor-networks and a relatively small number of practical experiments. Building on the state-of-the-art of RRI the presentation will explore pathways for the further development of this political innovation (invention). In particular, I will discuss coming challenges and structural requirements for learning and experimentation in the field of Technology Assessment, which is treated as one of the main pillars of RRI.

S4 (2): RESPONSIBLE RESEARCH AND INNOVATION

Chairs: *Erich Griessler*, Institute for Advanced Studies, Vienna; *Erich Polt*, Joanneum Research, Vienna; *Bernhard Wieser*, STS / IFZ, Graz, Austria

Contested Notions of Responsibility in Climate Engineering Discourse
Nils Matzner, Institute for Science, Technology and Society Studies, Alpen-Adria University Klagenfurt, Austria

In the face of global risks carried by climate engineering (CE, or geoengineering) technologies, little research has been done on questions of responsibility. CE is understood as the deliberate large-scale manipulation of the planetary environment in order to slow down global warming.

This paper provides results of examining how understandings of "responsibility" are conceived *of* and communicated *by* researchers, policy-makers, and civil society actors engaged in assessing or governing CE. Employing a discourse analytical approach divergent understandings of "responsibility" will be compared between the domains of science, policy, and civil society. Articulations of responsible research and governance on the one hand, and implicit notions of what responsibility means in research and governance on the other enable the discussion of Responsible Research and Innovation of CE with empirical material.

Mapping and Understanding Responsible Research and Innovation
Barbara E. Ribeiro, Robert D. J. Smith, Kate Millar, Centre for Applied Bioethics, University of Nottingham, United Kingdom

As a concept and project, responsible research and innovation (RRI) is being embedded in research policy across Europe but is still currently open to experimentation. This paper explores some of the important dimensions of RRI that remain opaque and disputed amongst researchers and practitioners. We reinterpret Owen et al's (2012) dimensions of ambiguity' (motivations, theoretical conceptualisations and translations into practice) as a point of departure to analyse a diverse body of literature on approaches to RRI. A total of 48 papers were selected through a systematic literature search followed by a content analysis. Our results suggest that RRI is a fundamentally integrative concept, embedding elements of existing approaches to the governance and assessment of emerging technologies. At its core rests scholarship from within STS that attempts to examine how science, technology and society mutually shape each other. In consonance with this scholarly background, RRI tries to do a lot; encouraging anticipation of future consequences of emerging technologies; reflecting on their societal and ethical aspects; as well as highlighting a need to recognise the embedded narratives, interests and values of different actors in technoscientific arenas. However, the concept is also a point at which STS is articulating with other disciplines and practices. We argue that, as with any collaboration, making the conceptual and practical assumptions, and the commitments that go with them, explicit will be key to the future of RRI as it co-evolves with academic and political agendas.

References
Owen, R., Macnaghten, P., Stilgoe, J. (2012). Responsible research and innovation: From science in society to science for society, with society. *Science and Public Policy, 39*(6), 751-760.

Tackling 'Glocal' Sustainability Challenges through collaborative bottom-up RRI governance practices
Sandra Karner, STS/IFZ, Graz, Austria

Science and innovation policies are increasingly focusing on research and innovation that should be accountable to society, and help to tackle society's great challenges. Widely these policies are formulated against the dominant normative 'competitiveness' framing, where research is essentially expected to contribute to economic growth and greater competitiveness. However, there is also a different, alternative normative framing where research and innovation should in the first instance lead to sustainability and human wellbeing in the long term. Such a sustainability-oriented science policy considers research to be innovative if it supports the transformation towards a more sustainable future. In contrary to the 'competitiveness' framing, which is often defined as 'value-free', sustainability science clearly implies a societal relevant value dimension (e.g. due to the ambiguous and controversial meaning of sustainable development).

Moreover sustainability research is challenged by different scales and governance levels. Although many present-day sustainability problems are of global nature, their manifestation is locally situated, and influenced by local conditions. Likewise strategies and solutions to deal with these problems often depend on the local context. Finally, a reduction of scope to a sufficiently concrete level helps to clarify the relevant value dimensions, and the diversity of attitudes that the various stakeholders confronted with the challenge and possible solutions hold.

FoTRRIS, research project funded under Horizon 2020, which will start this autumn, will address how the research inherent issue of values could be addressed. The project will facilitate new governance practices to co-design locally situated transdisciplinary RRI projects that are attuned to local needs, values and opportunities that

connect and mobilise local stakeholder in order to address sustainability challenges connected to resource scarcity.

My presentation will outline the project's process architecture, which translates the concept of RRI into the concept of 'glocal sustainability research'.

Including Gender as an RRI Dimension

Helene Schiffbänker, Joanneum Research, *Katy Whitelegg*, AIT; *Angela Wroblewski* , HIS,
Vienna, Austria

This abstracts addresses gender as one of the six RRI dimensions aimed at improving the research and innovation process. It has already been proven that the gender dimension, as a standalone dimension, improves the functioning of the innovation process through addressing biases in the system that exclude women's participation and through including the gender dimension in the research content.

Although the general ambitions behind integrating the six RRI dimensions can only be applauded into one overarching concept that addresses these issues simultaneously, there are several open issues when looking at the integration from the gender perspective. The presentation focuses these issues which are

- What does the inclusion of gender in the RRI dimensions mean for the gender dimension? Does anything have to change or can the established practices stay the same?
- Does gender loose some of the importance it has achieved in research and innovation processes through becoming one of six dimensions or does it gain additional weight?
- How does the integration of gender affect the other dimensions?
- What does the integration of gender in RRI mean for current structures that support the integration of gender? Will the institutionalization change in any way and what will this mean for the gender dimension?

    We will discuss these issues both on a conceptual level as well as for the Austrian context.

The Need for New Approaches to Intellectual Property Rights in the Context of Responsible Research and Innovation

Franc Mali & Toni Pustovrh, University of Ljubljana, Slovenia

The context of the European Responsible Research and Innovation strategy (RRI) shows the need for a shift towards new approaches for the normative regulation of new emerging technologies. In the perspective of RRI, soft legislation (codes of conducts, open source, etc.) needs to reflect a good R&D and innovation policy (Von Schomberg, 2013; Owen, Macnaghten, Stilgoe, 2012)**.** The use of such soft (more flexible) regulatory mechanism is particularly useful when the application and usefulness of traditional legislative actions is uncertain. The recent debates about how to approach the issue of intellectual property rights (IPR) in the case of the new emerging technologies are also part of a general RRI problem, that is, how to employ »soft regulatory tools« in order to increase the efficiency and commercialization of innovations on the one hand, and democratize their production, use and control on the other.

In our contribution, we will focus on IPR issues in synthetic biology. Synthetic biology represents one of the most advanced (transdisciplinary) fields of modern biosciences, where the contradictions regarding how (if at all) to legally protect and commercialize bioinventions have recently begun to pile up. The reasons are manifold: in synthetic biology, it is much easier to patent altered DNA sequences than those derived from natural sources; the massive infrastructure and tasks connected with the commercialization of the results of synthetic biology call for a withdrawal from the rigid patenting of inventions; the types of methods, techniques and databases (software, biobricks, etc.) employed open questions about the use of new forms of IPR (copyright, licensing, etc.); etc. We will attempt to explain these new dilemmas of synthetic biology in the context of th past and recent regulation of property rights in the biogenetic sciences in general. In our exploration of the open questions and dilemmas of IPR in the new emerging technologies we will also use the results of empirical research that we have conducted at the European as well as the national (Slovenian) level.

S5: BEYOND BIBLIOMETRICS: NEW APPROACHES TO MAPPING SCIENCE AND TECHNOLOGY

Chairs: *David Budtz Pedersen, Lasse Johansson, Jonas Grønvad,*
Humanomics Research Centre, University of Copenhagen, Denmark

Beyond Bibliometrics and Altmetrics: New Approaches to Mapping the Societal Impact of the Social Sciences and Humanities
Gunnar Sivertsen, Nordic Institute for Studies in Innovation, Research and Education (NIFU), Oslo, Norway

In contrast to other areas of research, where research is international and usually transferred to societal use by other means than the researchers' own publications, the societal impact of research in the social sciences and humanities (SSH) can often be traced back to specific authors and their publications for wider audiences in a specific culture or society.

Traditional bibliometric data sources have never covered properly the external part of the publishing activity in the SSH. Altmetrics has a limitation as well by mainly covering social media. A distinction between "social impact" and "societal impact" is needed. The societal impact of the SSH is realized in fundamental societal institutions for education, reading, writing and publishing, performing arts, cultural and religious life, political and legal processes, policy making, and public debate. I will explore how national information sources that cover these institutions directly – and independently of the researchers' own web activity – might be matched to institutional or national current research information systems in order to give a more comprehensive picture of the societal impact of the SSH.

Measuring Interdisciplinarity: A Mixed-Methods Approach
Jonas Grønvad, Lasse Johansson, Humanomics Research Centre, University of Copenhagen, Norway

There is nothing new about the concept of interdisciplinarity. It pops up from time to time in the debate over the organization of science and technology, and since the mid-1990s it's been guiding new funding initiatives, university reforms, etc. It is probably the single most defining characteristic of the so-called mode-2 science, described in *The New Production of Knowledge* (1994). All this hype has given rise to a growing body of research on interdisciplinarity. Most studies have used and continue to use co-authorship or citation data to study the relations between disciplines. These approaches are very convenient from a network perspective because of the

availability of large digital databases. However, we can can only answer very few and simple questions with these approaches. We can't answer questions like: What characterizes the actual research collaboration that leads to a co-authored publication? Why are people citing a specific paper more than other papers? And does interdiscipline citations necessarily imply any exchange of ideas, methods, etc.? In this paper we discuss other alternative approaches to measuring interdisciplinarity, based on a research project on the field of humanities in Denmark. Here we use survey data and systematic readings of academic texts to study various aspects of interdisciplinary relations: the role of academic training and supervision, research collaboration on project proposals, empirical work and publications, and influence of other fields of science on research styles in the humanities. We argue that the combination of different methods (including bibliometric ones) contributes significantly to the understanding of the research object.

Changing Governance for Responsible Research and Innovation: The Role of Evaluation
Emanuela Reale, Institute of Research on Sustainable Economic Growth IRCRES (former CERIS), National Research Council CNR, Rome, Italy

Responsible Research and Innovation (RRI) gained a momentum in STS studies from 2011, when a Workshop promoted by the DG Research to building the notion of Responsible Research and Innovation in Europe (EC 2011), ended up with: a) the concepts of science for society, targeted to Europe's societal challenges and to the production of a right impact; b) the concept of science with society, thus on responsiveness of research and innovation to society in the face of the uncertain effects that can be produced; and finally c) the need to make the motivations and the intentions for actions in R&I more democratic.

Several pieces of literature discussed the key RRI dimensions, and the need of mechanisms able to explore the type of impact a decision of science might produce, with assessment and forward looking processes, anticipatory governance, accountability tools (Callon et al, 2009; Felt et al., 2007; Guston, 2012; Owen et al., 2012; Hessel et al., 2009; Rip, 2011; van den Hove, 2012), as well as frameworks for supporting the development of RRI (Stilgoe et al., 2013).

The paper wants to contribute to the debate concentrating on the results of the recent SiS-RRI Stocktaking Conference 2014 (http://www.sis-rri-conference.eu), and particularly on issues related to governance (Reale, 2014), highlighting the role of different actors in a multi-level and multi-layered policy space such as R&I policy. Moreover, the institutionalization of RRI is likely to impact reforms and restructuring processes, as well as missions of the mentioned organizations. In this respect the importance of evaluation, forward looking and new metrics are discussed.

S6 (1): SCIENCE AND ECONOMY: SOCIOTECHNICAL NETWORKS AND THE USE OF KNOWLEDGE

Chair: *Luísa Veloso*,
Centre for Research and Studies in Sociology, University Institute of Lisbon (CIES-IUL), Portugal

Framing of Science, Technology and Innovation Policy in Times of Crisis
Inga Ulnicane, Institute for European Integration Research EIF, University of Vienna, Austria

In response to global financial crisis, policy-makers in particular in the European Union have come up with a strong rhetoric about the major economic role of research and innovation as sources of renewed growth. On the basis of analysis of EU policy documents in times of financial crisis (2008-2015), statistics and interviews with EU and national policy-makers and research stakeholders[i], this paper argues that in times of crisis the framing of science, technology and innovation (STI) policy has shifted to emphasize economic impact, contribution to jobs and growth and importance of applied research, as can be seen in the new Horizon 2020 program where industrial leadership is one of the priorities. Against the background of historical evolution of economic, scientific and social rationales of STI policy, this paper explores how the expectations towards science, its contribution to economic growth and collaboration with industry has been affected by the economic crisis. Additionally, it is analyzed how this economic role of science interacts with other major EU STI policy frames today such as societal challenges, frontier research and responsible research and innovation.

[1] Ulnicane, I. (2015) Research and innovation: sources of renewed growth? In G.Falkner (ed.) European integration in times of crisis: Constraining and/or facilitating effects. Forthcoming.

Peer Review in Research Funding: The Role of Scientific Expert Knowledge
Thomas König, Institute for Advanced Studies, Vienna, Austria

This paper takes a fresh look at peer review as a research object. Obviously, participating in peer review has become an important part of every researcher today; it is the most appreciated model of allocating funding for research. However, there are only little known about the ways peer review in research funding is conducted, what differences exist in different implementations of the process, and, most importantly, how peer review can obtain its status as the most accepted mode of allocating public funds to research projects.

The paper is based on an in-depth study of peer review at a highly reputable funding agency, and uses theoretical work by sociologist Luc Boltanski and political theorist Jon Elster. It argues that, a) peer review in research funding has to be seen as separate from other instances where peer review (as decision-making mechanism) is employed; b) its continuous success lies in the unique ability to establish dual legitimacy, towards the scientific community on the one hand and the policy-makers on the other; and c) that the scientific expert knowledge developed in preparation, as well as during the process, is a core component of this legitimacy work. Thus, the paper aims to come up with a more systematic understanding of what types of knowledge is involved in the peer review, and how it relates to the other components of the peer review.

Flow Between the Production and Transmission of Knowledge

Teresa Patrício & Patrícia Santos, Centre for Research and Studies in Sociology, University Institute of Lisbon (CIES-IUL), Portugal

The changes in how scientific knowledge is produced as well as transformations in labour markets are forces that have led to a renewed debate on the relationship between research and postgraduate education. The graduate level of education is now integrated in the research system with the availability of "critical mass" of students as a condition to sustain research capacity and thus the reputation of universities. It also contributes to strengthen the collaboration with the industry. In Portugal, universities have significantly expanded their post-graduate programs. The International Partnerships Program with three top universities in the USA (MIT, CMU and UTA), implemented in 2006, stimulated this effort of reconfiguration. This communication explores strategies and activities that reinforce the links between graduate education and scientific development within this Program as key components of the interconnection between knowledge and innovation. To this end, we explore data collected in a survey of students in the education programs created (n = 182). We also present some results of interviews conducted with PIs on projects under this Program (n = 48). In the education program, we highlight tasks, skills and networks developed by students in the context of the research agenda. In terms of research, we analyze the role of students in the production and transfer of knowledge. The Program have designed a more prominent role for students in the research system and opened major scientific and international options for students. The questions are will the Program maintain its impetus and have a structuring effect on the Portuguese higher education system as a whole?

S6 (2): Science and Economy: Sociotechnical Networks and the use of knowledge

Chair: *Luísa Veloso*,
Centre for Research and Studies in Sociology, University Institute of Lisbon (CIES-IUL), Portugal

Translation of Science and Technology Projects through the TED Infrastructure: A Cultural Capital Perspective

Heidi Gautschi, Gianluigi Viscusi, École Polytechnique Fédérale de Lausanne, EPFL CDM, Switzerland

This paper seeks to investigate the TED infrastructure as a *dispositif* (Agamben, 2006; Bussolini, 2010) for translating Science and Technology (S&T) projects. We aim to adopt the concept of cultural capital as an interpretative lens for analyzing the dynamics enforced by or emerging from the TED infrastructure, questioning their relationship to selection and outcomes of presenter-related S&T projects. In "Les trois états du capital culturel" (1979), Pierre Bourdieu outlined the three forms of cultural capital: the embodied state, the objectified state and the institutionalized state. For our purposes, we have chosen to focus on cultural capital within the embodied state and the institutionalized state, as these two seemed most relevant to the relationship building side of S&T projects. The "embodied state" refers to the cultural capital that resides within an individual, whereas the "institutionalized state" refers to titles, diplomas and similar types of artefacts that represent achievements in the "cultural" domain. While cultural capital is most typically applied to education and educational systems, we believe that it is relevant to understanding not only how relationships between the shareholders in S&T projects are constructed, but also how participation in the project reinforces individual and institutional cultural capital. Thus, we have chosen to analyze TED talks in order to identify the relationship between those with high levels of embodied state cultural capital and the S&T projects they are associated with (i.e. close/weak relationship).

References
Agamben, G. (2006). *Che cos'è un dispositivo?*. Roma: Nottetempo.
Bourdieu, P. (1979). Les trois états du capital culturel. *Actes de La Recherche En Sciences Sociales*, *30*, 3–6. doi:10.3406/arss.1979.2654
Bussolini, J. (2010). What is a Dispositive? *Foucault Studies*, *10*, 85–107.

Talking about Technology and Innovation: The Genres of Theories of Socio-Technical Change

Harro van Lente, Faculty of Arts and Social Sciences (FASoS), Maastricht University, The Netherlands
Alexander Peine, Utrecht University, The Netherlands

Socio-technical change has been studied in many different ways, both in STS and in innovation studies. In this paper we compare and contrast various theories of technology from the fields of innovation studies and STS. We delineate eight theories of technology from innovation studies and STS, which either relate to economic traditions (neo-Schumpeterian economics, innovations systems and path dependencies), socio-historical traditions (SCOT, large technical systems and the multi-level perspective) or management traditions (diffusion of innovation, technology cycles). First, we analyze the central concepts, the frameworks of argumentation and the strategies of intervention they suggest. Second, we compare the theories in five dimensions: (i) levels of aggregation, (ii) technology as process or as outcome, (iii) technology as knowledge or as material, (iv) descriptive vs prescriptive ambitions (v) theory as perspective or as substantial claim. Third, we investigate whether and how theories draw from particular 'genres'. In general, theories mobilize concepts and offer storylines to convey a message to readers. To distinguished basic categories of storylines, literary studies use the notion of 'genre': the narrative structures of romance, comedy, tragedy and satire. We investigate how the lessons about successes, failure, dynamics and unforeseen consequences are presented in storylines with (human or non-human) protagonists. We conclude that apart from their explicit conclusions, theories of technology also bring implicit lessons and recommendations, due to the format of a genre.

Science and Economy: Sociotechnical Networks and the Use of Knowledge - Final Remarks and Defies for the Ongoing and Future Research

Luísa Veloso, Centre for Research and Studies in Sociology, University Institute of Lisbon (CIES-IUL), Portugal

In my presentation I will propose a brief set of remarks concerning the papers presented at the 14th Annual STS Conference Graz 2015: "Critical Issues in Science, Technology and Society Studies" in the session on the theme mentioned in the title, aiming at promoting the debate of all the participants on the relationship between the state, universities, companies and other organisations that are potential users of scientific knowledge. With this presentation I will also propose the research axes which arose from the presentations on the session, aiming at promoting a discussion on the continuities and renovations of a research programme about the relations between Science and Economy.

S7 (1): DOES QUALITY COUNT? ON THE ROLE OF METRICS IN ACADEMIC ACCOUNTABILITY POLITICS

Chairs: *Sarah de Rijcke,* Centre for Science and Technology Studies, Leiden University, The Netherlands
Tereza Stockelova, Institute of Sociology, Czech Academy of Sciences, Praha, Czech Republic

Metrics as Infrastructures for a Marketization of Research on the Epistemic and Social Consequences of the Accumulation of Evaluative Worth in Contemporary Academia
Maximilian Fochler, Department of Science and Technology Studies, University of Vienna, Austria

The metric assemblages that pervade contemporary academic life are part and parcel of a new governance regime. The re-structuring of academic institutions and with it academic career structures along the logics of the new public management has been argued to be part of a wider neoliberal agenda which imprints the cultural form of the market as a template for the activities of ever more societal domains. If that is the case, then through the eyes of recent STS studies on markets and economization, metrics and their institutional uptake are a key infrastructure governing the conduct of researchers as actors on this market. In this, metrics do not only enact excellence, reputation and impact, but beyond that also become a symbolically generalized medium for expressing worth. If we ask what this development may mean for the social and epistemic development of science, as well as for its capacity to act responsibly, then we need to interrogate how this new register for creating and attributing worth relates to other ways of asserting worth in doing research.

My paper will sketch this perspective and illustrate it with examples drawn from fieldwork in the Austrian academic life sciences.

Walking a Tightrope: Natural Science Research Organization between the Dynastic and Dynamic Organization and Implications for Researchers' Careers
Marcela Linkova, Institute of Sociology of the Czech Academy of Sciences, Prague, Czech Republic

Since the new millennium metrics-based research assessment has played a growing role in research and development policy as well as in the practices of organizing research and establishing quality of Czech research and higher education (Linkova and Stockelova 2012; Linková 2014; Stockelova 2012). The introduction of research assessment has elicited various types of responses from researchers and organizations, including strategic behaviour as well as resistance (Linkova 2014). While the research assessment systems introduced at the institutional level may appear straightforward, research has documented how institutions and its representatives mobilize or fail to mobilize research assessment in particular contexts to achieve particular goals and that institutions need to achieve various types of goods in different contexts (Linková 2009, 2014; Stöckelová 2009).

In the presentation, I draw on two projects carried out in two institutes of the Czech Academy of Sciences, both of which are considered excellent in the international context, one located in Prague and the other in Brno. Building on a distinction between the dynastic and dynamic research organizing (Linková and Červinková 2013; Linková 2014), I will discuss the enactments of research assessment at these organizations. While an assessment based on impact factor publications sets the tone, the two institutions also navigate the "attestation" system valid in the Czech Academy of Sciences as well as their other developmental needs. In my presentation I will discuss the opportunities and risks this multiplicity creates for individual researchers on an increasingly internationalized academic labour market, including the ways gender plays out.

Bibliography

Linkova, Marcela. 2014. "Unable to Resist: Researchers' Responses to Research Assessment in the Czech Republic." *Human Affairs* 24(1):78–88.

Linková, Marcela. 2009. "Ne Každý Úspěch Se Počítá: Excelence a Genderování Vědecké Dráhy v Přírodních Vědách." Pp. 72–99 in *Akademické poznávání, vykazování a podnikání. Etnografie měnící se české vědy*, edited by Tereza Stöckelová. Praha: Sociologické nakladadatelství.

Linková, Marcela. 2014. "Disciplining Science: The Impacts of Shifting Governmentality Regimes on Academic Research in the Natural Sciences in the Czech Republic." Charles University in Prague, Faculty of Social Sciences.

Linková, Marcela, and Alice Červinková. 2013. "„ Vlastní Laboratoř ": Akademické Trajektorie a Gender v Současných Biovědách." *Gender, rovné příležitosti, výzkum* 14(1):15–26.

Linkova, Marcela, and Tereza Stockelova. 2012. "Public Accountability and the Politicization of Science: The Peculiar Journey of Czech Research Assessment." *Science and Public Policy* 39(5):618–29.

Stockelova, Tereza. 2012. "Immutable Mobiles Derailed: STS, Geopolitics, and Research Assessment." *Science, Technology & Human Values* 37(2):286–311.

Stöckelová, Tereza. 2009. "Politická a Morální Ekonomie Vědy." Pp. 37–71 in *Akademické poznávání, vykazování a podnikání. Etnografie měnící se české vědy*, edited by Tereza Stöckelová. Praha: Sociologické nakladadatelství.

Metrics and Emotions: Perspectives from Anthropology
David Mills, Department of Education, University of Oxford, United Kingdom

The emergence of measures and targets at the heart of academic life is at once a social and technical achievement. Critical scholarship has focused on theorising these new forms of university governance rather than the disciplinary emotional regimes (Reddy 2001) that support or contest their legitimacy. The affective dimensions of academic affiliation, vocationalism and autonomy are all key to an understanding of accountability politics and its power.

In this paper I unpack one such emotional regime, drawing on a range of archival sources to document how anthropologists confronted the Thatcher government's budget cuts of the early 1980s, and the precedents these exercises set for subsequent research assessment exercises.

I combine historiography with ethnographic vignettes to explore the affective dimensions of 'excellence' in the social sciences today. Experiences of this redefinition of academic practice differ markedly across academic generations, institutions, fields and the academic life-course. I show how the responses and 'proactive adaptations' (Morris and Rip 2007) of social scientists range from disciplined ignorance to ambivalent complicity, from institutional nostalgia to politicised critique, and from academic activism to bureaucratic entrepreneurialism.

S7 (1): DOES QUALITY COUNT? ON THE ROLE OF METRICS IN ACADEMIC ACCOUNTABILITY POLITICS

Chairs: *Sarah de Rijcke*, Centre for Science and Technology Studies, Leiden University, The Netherlands
Tereza Stockelova, Institute of Sociology, Czech Academy of Sciences, Praha, Czech Republic

Bibliometrics as an Administrative Practice: Matters of Concern, S&T Governability and Cultural Change. A Case Study
Yuri Jack Gómez-Morales, Centre of Social Studies, Universidad Nacional de Colombia, Bogotá D.C., Colombia

This contribution renders an account of the introduction and further development of Bibliometrics as an administrative practice in Colombia's S&T system as a means for rendering the country accountable for the

development loans made by the Interamerican Development Bank, a major S&T founding agency in Latin America throughout the second half of the twentieth century. This particular case study might not been entirely representative of Latin America as a whole but serves well the purposes of the special STS session on critical issues in as much as it illustrates a) construction of "scientific production" as a "matter of concern"; b) the institutional path that this new matter of concern points for institutional actors involved in S&T policy and development; c) cultural transformation of scientific communities and their agendas.

This account is based on my early work experience as a bibliometrician developing tools for evaluating local scientific journals early in the 1990s and on my latter role as an STS practitioner criticizing the unintended consequences of rational action (measuring) in S&T policy in Colombia. Thus the account encompasses twenty years of observation and empirical work both in bibliometrics and STS.

A Critical Discussion of the Attempts to Represent "Quality" and "Excellence" in National Systems for the Evaluation and Funding of Research Institutions
Gunnar Sivertsen, Nordic Institute for Studies in Innovation, Research and Education (NIFU), Oslo, Norway

During the last two decades, most European countries have tried to move towards what is politically understood as increased accountability by establishing partly performance-based funding systems for universities and other research organizations. Some of these systems are based directly on performance indicators, others on qualitative peer review that may be informed by performance indicators. In addition, some countries have established national systems for institutional research evaluation without funding implications so far. The overall picture is changing and becoming more complex. Countries are learning from each other and discussing alternatives, and some countries are presently moving from one type of system to another, or combining them.

Peer review-based models are often deemed superior to indicator-based models in representing and promoting "quality" and "excellence". However, in the context of institutional evaluation and funding, both of them are faced with challenges. I will give a critical discussion of solutions and developments in a group countries where I know the situation through direct engagement or contact: Australia, Belgium (Flanders), Czech Republic, Denmark, Estonia, Finland, Italy, Netherlands, Norway, Portugal, and Sweden.

"Where Are the Metrics?" Organised Ambiguity in an Institutional, Impact-Oriented Research Assessment Exercise
Alex Rushforth & Sarah de Rijcke,
Centre for Science and Technology Studies (CWTS), Leiden University, The Netherlands

Over the past two decades societal impact of research has become an increasingly important trope in European science policy discourses, and is now beginning to enter as formal criteria of certain research evaluation programs. However, so far the incorporation of this register within practices for assessing academic institutions has attracted relatively little attention. This paper attends to this topic through drawing on ethnographic fieldwork carried out during a five-yearly external assessment of research at a University Medical Center in the Netherlands. The event followed a standardised protocol format required of all Dutch universities by law, however, less typically the organisation requested societal impact take center stage in the assessment; with the role of quantitative performance indicators downplayed in favour of narrative-based 'impact' stories. How peer-review panels, evaluation officers, and members of the medical center confronted and managed emerging instabilities and

ambiguities in the assessment process is the focus of our analysis. Whereas science policy literature has tended to consider ambiguity a burden for evaluating 'societal impact' – here we position this as part of the process of institutional assessment work which actors engage and manage. We end by discussing empirical and conceptual implications for researching academic assessment practices, particularly in relation to the emergence of 'third mission' indicators.

Scaling Up and Down the Audit in Academia
Tereza Stockelová, Marcela Linková
Institute of Sociology of the Czech Academy of Sciences, Prague, Czech Republic

Drawing upon ethnographic research in a Czech bioscience research institute, the paper explores the triangular relationships between research assessment, "dynamic" research teams and competitive research funding. We trace the audit practices and argue that audit does not trickle down in the academia from outside to inside – from (trans)national policies to institutions, teams and individuals but circulates in between these, scaling up and down. While showing spaces of incoherence, resistance and contest we can nevertheless point to the changing *nature* of academia as it is (re)enacted in the audit practices. These changes have social, ethical but also epistemic consequences.

CT: Information and Communication Technologies and Society

S9: STS and "New" Media

Chairs: *Joachim Allgaier, STS –*Institute for Science, Technology and Society Studies,
Matthias Wieser, Department of Media & Communications,
Alpen Adria University Klagenfurt, Austria

Science and Technology Studies of Social Media
Joachim Allgaier, STS –Institute for Science, Technology and Society Studies, *Matthias Wieser*, Department of Media & Communications, Alpen Adria University Klagenfurt, Austria

There is a growing community within STS and related areas analysing the role of social media and new communication technologies for the public communication of science and also for inner-scientific communications. In addition, a new and increasing interest in overlapping research topics in media research and science and technology studies came to light in the recent years. Media studies discovered STS in order to revitalize discussions about the materiality of media, as well as empirical research into (online) media practices. At about the same time many STS scholars have recognized that information and communication technologies are prevailing technologies today that are having an impact on many areas of society, also on science and technology. Contemporary scientific practices and communication are heavily influenced and may sometimes even be dependent on new digital media. Moreover there is a growing body of literature and research on using new media for STS research under the banner of digital methods, which do at the same time contribute to methodological

questions in media studies research. In this contribution we are introducing and explicating the topic of the session and we are providing some illustrative examples.

Problematizing the Internet as a Video Distribution Technology: An Assemblage Theory Analysis

John Hondros, School of Media, Film and Music, University of Sussex, United Kingdom

While the Internet has rapidly become an important distribution technology for video producers, it is also a problematic one for some of them. I explore the difficulties associated with its use to distribute videos through an analysis of a one-year ethnographic investigation of community, activist and fan video producers in the US and UK. My analysis draws upon Actor-Network Theory and DeLanda's reading of Deleuze and Guatarri's concept of assemblages, and shows that while my informants were engaged in various processes to create and stabilise their video distribution assemblages, these were precarious as they were also subject to destabilising processes resulting from their complex and contested nature. This situation often resulted in the producers being left with distribution assemblages which did not satisfy their goals. Framing the problematic aspects of their distribution practices in these terms shows that these aspects can not only be understood as resulting from the producers' specific circumstances as they struggled with, for example, corporate interests, the limited affordances of the video hosting and social media platforms they used, or the social dynamics of which they were apart, but that they can also be understood more generally as arising from the processes of human-technology entanglements, thus providing an alternative perspective to previous studies.

Interactions between STS and "New" Media: Investigating the Selfie as a Dance of Agencies

Sabrina Sauer, Mediastudies department, University of Amsterdam, The Netherlands

This paper focusses on how STS-concepts from user studies (Oudshoorn & Pinch, 2008) and the notion of the dance of agencies (Pickering, 1995) can help to understand the recent and popular phenomenon of selfie-taking as a practice through which producers of selfies gain agency in sociomaterial configurations (Orlikowski, 2009). Within Media Studies, selfies are often analysed in relation to questions of identity, subjectivity, and image and genre theory (Rettberg, 2014). Instead of solely concentrating on the images that are created in the process of producing selfies, this paper investigates how digital, social and mobile technologies (including selfie sticks) resist and accommodate user agency. Furthermore, selfie-taking is understood as a dance of agencies between actors; instead of analysing the object or image, the practice of creating selfies is viewed as one through which meaning and materiality are enacted together. This analysis seeks to understand this enactment by underlining ongoing tensions between users and technologies, and between materiality and the alleged superficiality of the selfie, in order to move beyond the image. This, in turn, may lead to ideas about other "technologies of the self", how these resist and accommodate user agency, and how STS and media theory may further complement one another.

References
Orlikowski, W. J. (2009). The sociomateriality of organisational life : considering technology in management research. *Cambridge Journal of Economics*, *34*, 125–141.
Oudshoorn, N., & Pinch, T. (2008). User-technology relationships: some recent developments. In O. Amsterdamska, E. J. Hackett, M. Lynch, & J. Wajcman (Eds.), *The Handbook of Science and Technology Studies* (pp. 543–565). Cambridge, MA: MIT Press.
Pickering, A. (1995). *The Mangle of Practice: Time, agency and science*. Chicago and London: University of Chicago Press.
Rettberg, J. (2014). *Seeing Ourselves Through Technology*. New York: Palgrave Macmilian.

Counting Clicks Instead of Citations - YouTube Videos as Scientific Currency
Andreas Bischof, Junior Research Group »CrossWorlds«, Chemnitz University of Technology
Göde Both, Department of Flight Guidance, Technische Universität Braunschweig, Germany

YouTube videos have become a regular feature of the scientific practices in robotics as well as in other sciences. Nevertheless, video demos remained an under-explored topic in STS. By bringing together our ethnographic studies on the realities of social robotics on the hand and self-driving car research on the other hand, we aim at advancing the discussion on video demos. In our contribution to the panel we seek to map a possible range of video demos, using robotics as an example. Rather than studying video demos as a thing-in-itself, we follow a relational approach by focussing on the life worlds of video demos. In the presentation we will look at three different analytical dimensions: 1.) the organizational identity of the research institutions 2.), the culture of robotics research, and 3.) video demos as boundary objects.

Thereby we are able to distinguish between different processes and meanings closely entangled to the increasing production and consumption of such videos. We are going to discuss our analysis of the social functions of these videos mainly in two ways. On the one hand we will examine the meaning of YouTube videos for robotics and its generalized assumptions, narratives and imaginaries of possible futures (Suchman 2011). On the other hand we are seeking to contribute to the discussion about the mediatization of science (Schäfer 2014) by interpretating our results as sub-processes of this overarching development.

References
Schäfer, Mike (2014): The Media in the Labs, and the Labs in the Media. What we Know about the Mediatization of Science. In Lundby, Knut (Ed.): Mediatization of Communication. Vol. 21 of the „Handbooks of Communication Science". Berlin: de Gruyter Mouton: 571-594.

S10: What is so Fascinating With Computer Science? How We, Informaticians and Others Deal With it

Chair: *Dirk Siefkes,* Technische Universität Berlin, Germany

Do We Talk to Each Other Through Computer Science
Teresa Macchia & Vincenzo D'Andrea, University of Trento, Italy

This is per se a fascinating track and question that blows directly on my face: like one of that rainy and windy scenes in old movies when a newspaper is blowing in the face of someone giving a aha moment. I am a sociologist, doing my PhD in computer science; ending my doctoral journey, I realized a couple of reasons about computer science that really fascinating me: first the "language", second, the pervasiveness of computer science.

My research project on design for museum spaces seeks to understand how designing interactive and technologically enhanced spaces support sharing knowledge. Through my case studies in two different, even opposite, museums, I realized that Information Communication Technologies (ICTs) let museum visitors and staff to find their own path to interpret (here it is the language!) the environment and make sense of it. Thus, computer

science, that seems something that belongs to computer scientist (e.g. programmers), is on another level and at the same time, an everyday experience that belongs to everyone (pervasiveness!).

Computer Science as Science of Socio-Technical Design. Examples from Ubiquitous Computing
Ingo Schulz-Schaeffer, Institute of Sociology, University of Duisburg-Essen, Germany

As Herbert Simon (1996 [1969]: 3) has suggested, engineering sciences should be viewed as „sciences of the artificial".
Accordingly, they should be conceived as sciences of design, sciences which are "concerned not with the necessary but with the contingent not with how things are but with how they might be in short, with design" (p. xii). Unfortunately, engineering sciences tend to understand themselves as similar to natural sciences and, thus, to ignore design issues" (p. 112). What is fascinating with computer science is that, in contrast to other engineering sciences, it has a long-standing tradition of being a science of design (cf. Schulz-Schaeffer 1996), and, what is more, as a science of design which aims at designing not only technology but social structures and processes as well.

This characteristic of computer science as a science of socio-technical design becomes very obvious in cases in which computer scientists orient their engineering activities at socio-technical scenarios. Scenarios of this kind are descriptions of future situations of the envisioned technology in use, descriptions which address technological features in relation to corresponding features of the envisioned social situation of use and, thus, technological requirements in relation to social requirements (and vice versa). The talk will provide empirical evidence for how computer scientists are designing socio-technical settings by using scenarios as a means of "inventing the future" The evidence stems from empirical research on the role of scenarios in ubiquitous computing development projects (cf. Schulz-Schaeffer 2013). The research has been funded by the DFG and includes interviews with and documents from ubiquitous computing researchers in Japan, the USA, and the EU.

Schulz-Schaeffer, Ingo (1996): Software-Entwicklung zwischen Ingenieur- und Designwissenschaft. Überzeugungskraft und nützliche Widersprüchlichkeit von Software-Engineering und Software-Gestaltung, in: Hans Dieter Hellige (Hrsg.), Technikleitbilder auf dem Prüfstand. Leitbild-Assessment aus Sicht der Informatik- und Computergeschichte, Berlin: Edition Sigma, S. 115-140.

Schulz-Schaeffer, Ingo (2013): Scenarios as Patterns of Orientation in Technology Development and Technology Assessment. Outline of a Research Program, in: Science, Technology & Innovation Studies 9(1), S. 23-44.

Simon, Herbert A. (1996 [1969]): The sciences of the artificial, Cambridge, MA: MIT press.

Consequences of IT-use, Good and Bad. What Can and Should We, Computer Scientists and Others, Do About It?
Dirk Siefkes, Technische Universität Berlin, Fakultät Elektrotechnik und Informatik, Germany

In the title of the session I combine two topics: fascination with CS, and Dealing with IT. In the abstract, however, I write about fascination with IT (resulting from hybridizing man and computer) and maintain that it leaks into CS. Thus two types of questions arise: First, how does dealing with IT influence the user? Can we agree on good and bad consequences? How do they help or hinder develop our culture? In which certain directions? Second, how can and do we, computer scientists and others, influence fascination with IT? In the two other contributions to

the session CS is said to aim at design: of public spaces (Macchia e.a.) and of socio-technical settings in general (Schulz-Schaeffer). In designing anobject we develop its structure and function as well as its environment (both, material andliving), and interrelations between the two. Is CS as it stands suited for design? If not, what can we do about it? Should we try to change it? How then, do we agree on good and bad consequences? Or should we rather enjoy a CS with many faces, using the ones we like (see the paper below)? Would such a CS still be a science? Or a field of humanities? Or both? Or neither?

Literature:

http://tal.cs.tu-berlin.de/siefkes. Also Anja Zeising, Claude Draude, Heidi Schelhowe, Susanne Maaß Hg.:

Vielfalt der Informatik - Ein Beitrag zu Selbstverständnis und Außenwirkung.

Projekt InformAttraktiv. Staats- und Universitätsbibliothek Bremen 2014

http://nbn-resolving.de/urn:nbn:de:gbv:46-00104194-14

CT: Social Change in Science and Technology

S11: ICT Use, Energy Consumption and the Changing Practices

Chairs: *Thomas Berger & Anita Thaler,* STS / IFZ, Graz, Austria; *Natascha Compes & Jennifer Dahmen,* University of Wuppertal, Germany

Saving Battery Life, not Energy. Electronic media Use and Electricity Consumption Among Teenagers
Ana Horta[1], Nélia Nobre[1], Susana Fonseca[1], Mónica Truninger[1], Augusta Correia[2]
[1] Instituto de Ciências Sociais, Universidade de Lisboa, Portugal
[2] Instituto Universitário de Lisboa, Portugal

Electronic media are increasingly intertwined in teenagers' lives. Widening infrastructures and access to these technologies, as well as the proliferation of new gadgets and software, marketing and peer pressure encourage an intensive use. The relevance of these technologies regarding entertainment, social connections and access to information adds to teenagers' strong engagement with electronic media. Consequently, electricity consumption is a key element in their daily routines. Previous research has shown that considerations of energy saving do not influence the use of information and communication technologies by teenagers (Gram-Hanssen, 2005; Schmidt et al., 2014). However, findings from a survey administered to students enrolled in the ninth to twelfth grade of three secondary schools in Lisbon and from in-depth interviews conducted with Portuguese teenagers, show that most of them have developed competences and routines which allow them to save battery life. Yet, while they learn, for example, to change settings and turn off services to save battery life, in many cases they disregard the consequences of leaving their devices plugged in overnight. The paper discusses how these technologies, competences and meanings are interconnected and tries to analyze the dynamics of electricity consumption among teenagers. The results presented are part of a research project funded by the Portuguese Foundation for Science and Technology under the award EXPL/IVC-SOC/2340/2013.

The Digitalization of the School and its Environmental Challenges: Engaging Adolescents to Reflect on and Change their Use of ICTs Considering Climate Change Mitigation

Sara Heidenreich, Robert Næss, Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Trondheim, Norway

Technology is becoming increasingly important in the lives of adolescents. They are heavy users of new electronic communication forms (instant messaging, e-mail, and text messaging), as well as communication-oriented Internet site such as blogs, Facebook, twitter etc., and other sites for sharing photos and videos. They are also spending much money and time on ICT equipment. However, this use has environmental and climate impacts, which often are not thought about. What happens when adolescents are confronted with such issues? STS has been concerned with public engagement regarding science and technology. How may we manage the issue of disengagement?

In this paper, we analyse 7 focus group interviews and four workshops organised to elicit responses from adolescents regarding potentially important behavioural changes such as energy efficient ICT use, transformed ICT use, the effects of information campaigns and demands made in relation to new energy technologies. What are the main concerns of the youth with respect to reduce their ICT use and thus their use of energy in order to contribute to climate mitigation? Is it at all possible to consider disengagement with some forms of ICT?

Saving Energy on Use of ICT: Inertia and Embeddedness of Young People's Use of Information and Communication Technologies

Toke Haunstrup Christensen, Danish Building Research Institute, Aalborg University, Copenhagen, Denmark
Els Rommes, Institute for Gender Studies, Radboud University, Nijmegen, The Netherlands

The extensive use of information and communication technology (ICT) in everyday practices does not only have social implications, but also results in increasing consumption of energy and materials. Academics, NGOs and policymakers are beginning to address this issue and develop policies and campaigns to promote "sustainable" use of ICT.

The use of ICT is particularly widespread among young people, and this paper investigates how young people use ICT and interpret their own user practices and potentials for change. The analysis is inspired by STS and practice theory and primarily based on focus groups carried out in the Netherlands and Denmark as part of the EU project useITsmartly. In addition, we will refer to key findings from other countries participating in useITsmartly and from Dutch and Danish "creativity workshops".

Our results indicate that young people find it difficult to see a link between personal use of ICT and environmental problems. They are in general reluctant with regard to changing their own use of ICT, which is closely related to the integration of ICT across everyday practices and the social embeddedness of media use (in particular social media). This problematizes the traditional approach to sustainable behaviour, which emphasises the role of knowledge and attitudes in defining individual behaviour.

The paper concludes with a discussion of alternative approaches to promote more environmental-friendly user practices; in particular by taking advantage of the social embeddedness of young people's use of ICT and their personal experiences with negative "side-effects" of intensive ICT use.

Use IT – but Smartly!
Communicating Pro-Environmental ICT Usage to Young People
Thomas Berger & Anita Thaler, STS / IFZ, Graz, Austria;
Natascha Compes & Jennifer Dahmen, University of Wuppertal, Germany

Teaching and informing young people about sustainable and environmental friendly aspects of living is one of many important challenges of the 21st Century. Information and communication technologies (ICT) as an arena for diverse technology practices play an important role in adolescents' everyday lives. To 'google' something, to 'hashtag', or 'youtubing' are common pastime activities of young people. However, the ecological impact of those practices is elusive to most young users because the online electricity consumption is indirect and not observable. Furthermore, the grey energy embedded in the hardware and web-infrastructure remain hidden and hard to fathom.

The transdisciplinary EU-funded project 'useITsmartly' wants to address the question of energy efficient ICT usage via peer education. In a participatory approach with adolescents, it aims at capacity building and subsequent behavioural change. Based on two investigative empirical phases useITsmartly is testing several didactical concepts to inform and empower young citizens to lower the ecological footprint of their ICT use. The paper presented at the conference will inform about the background of the project as well as about work-in-progress results and insights.

S12: INTERSECTIONALITY AND DIVERSITY ISSUES IN CHANGING ICT PRACTICES

Chairs: *Thomas Berger*, STS / IFZ, Graz, Austria; *Jennifer Dahmen*, University of Wuppertal, Germany

Gender-Sensitive Use of Personas in Software Development
Maren Haag & Nicola Marsden, Heilbronn University

There are several methods of including the needs of real users in the software development process. The aim is to interrupt the dynamics of an i-methodological approach in which the software developers create products for themselves or base the requirement specifications on their own needs, abilities, mind frames and values. The persona method is used by designers, developers, and other stakeholders to mentally engage with users – helping everybody involved to identify with the users and ideate, design, and develop from the users' perspectives instead of their own.

To avoid stereotyping and reproduction of common social hierarchies personas have to represent the diversity of the users whilst being based on empirical data. On the other hand the software developers working with the persona set have to be able to read them and handle them respectfully in a non-stereotyping way. In qualitative group workshops we have confronted students with persona sets and used gender swapping to create multifaceted personas. The discussions were analysed and revealed gender and identity constructions of the IT-students. Additionally their own identity performance during the creative part of designing a software product became apparent and showed a core issue of approaches to include users in the software development process:

To put on a successful performance as a competent IT expert one does not need to show understanding of users' needs.

Towards an Equal Opportunities Job Platform: Using Web-Based Technology to Counter Discrimination in Recruiting

Andreas Schadauer*, ZARA - Civil Courage and Anti-Racism Work, *Benedikt Springer*, INSET Research & Advisory, Vienna, Austria

Technologies such as online job websites, social (career) networks and human resources software today play a crucial role at the labour market as they shape contemporary job search, application as well as recruiting processes of job seekers and employers respectively. At the same time, recent empirical studies have shown that it is particularly the first stage of the application and recruiting process that is prone to prejudices, stereotypes and discrimination against job seekers on grounds such as origin, gender or age. Yet, present technologies usually do not take this issue into account thus potentially reinforcing unequal treatment of certain groups when entering the labour market. As follow-up to our last year's presentation at the STS Conference on exclusion through job websites, this contribution asks how a web-based application and recruiting technology that fosters inclusion for all job seekers may look like. Drawing on the results of our R&D project *G@together – Get together without Barriers*, which aims at conceptualising an online platform for application and recruiting that enhances equal opportunities, we present key rationales and requirements of such a socio-technologic environment (e.g. anonymised application procedures, competence-based matching) as well as use cases and user interface mock-ups.

Is "The Gamer" Still a White Young Male? A Survey About Changing Gamer Stereotypes

Kerstin Raudonat & Nicola Marsden, Heilbronn University, Germany

Stereotypes reduce complexity and offer opportunities for identification. They are not simply labels – rather, they include assumptions about behaviors and traits that people in the labeled category are believed to posses. And they can change over time: As a result of the negative image of digital games in the end of the 80s and beginning of the 90s a strong and negative stereotype of a 'gamer' evolved that partly continues to resonate today: The picture of an isolated young male nerd in the basement playing video games all day - the term 'gamer' used to be purely negative and was considered an insult. In the last years digital games have become mainstream, being regarded as objects of cultural value. Therefore, it can be expected that stereotype content and differentiation has changed as well. The aim of this paper is to identify current stereotypes about 'gamers' and analyzing them with regards to diversity, identifying relevant subgroups and similarities and differences between the different groups and their intersections. In a survey of University students we identify and examine subgroups of 'gamers'. Preliminary results of an exploratory study show a move away from the negative stereotype of the unpopular, overweight and socially inept white male towards a more positive and more diverse representation of 'gamers'.

S13: Queer Feminist Science, Technology and Society Studies

Chairs: *Birgit Hofstätter,* STS/IFZ; *Lisa Scheer, Karl-Franzens Universität Graz / IFZ,* (AG Queer STS), Austria

<3? Relationship Categorisation in Social Research
Boka En, Department of Science and Technology Studies, University of Vienna, Austria

Social scientific research (qualitative as well as quantitative) often relies on the categorisation of its subjects in order to make sense of the world. This 'ordering' happens in a range of different ways, with demographic categories such as gender, race, age, class, etc. as the most common markers for categorisation. However, there are also more specialised ways of ordering the worlds we live in that differ between research fields. For example, research on intimate interpersonal relationships often categorises these relationships as well as the people who are in (or not in) them.

While ordering the world in social research may very well be unavoidable, work in Science and Technology Studies as well as Gender and Queer Studies has indicated that such ordering is never 'innocent': social research on intimate relationships may influence which relationships people can engage in. For example, while there is increasing academic interest in non-monogamous as well as non-romantic and non-sexual relationships, a large proportion of research on human relationships still focuses on dyadic, monogamous, heterosexual, sexual and romantic (as opposed to asexual/aromantic) relationships and thereby takes part in the social production of such relationships as the norm that everyone is expected to aspire to.

Utilising concepts from Science and Technology Studies and Gender and Queer Studies, I analyse academic publications on intimate interpersonal relationships with a mixed-methods approach in order to trace the ways in which social research on such relationships contributes to the normalisation of some and marginalisation of other ways of doing relationships.

Queer Objects: Care in Trans* Hormonal Practices
Esther Ortega, esCTS Network-Spanish Network of Science and Technology Studies, Spain

Hormonal treatments are considered almost mandatory in the different versions of international sex reassignment protocols for transgender health, known as Standards of Care (SoC) and edited by the World Professional Association for Transgender Health (WPATH). In Spain, two years of medical treatment are required in order to acquire legal recognition of sex change in the Spanish national legislation (Law 3/2007). This requirement is translated or understood as hormonal treatment in most cases.

Hormonal technologies have been considered as very efficient technologies and have remained unquestioned in the medical processes of sex reassignment. In other works, I have discussed hormonal treatment for trans people in the medical technologies framework as "blackboxing" processes - using an ANT term -.

Testosterone is one of these hormonal technologies. Testosterone have been considered the most powerful technology in relation to trans* men because, among other things, allows them to be recognized as men in the public space. In this sense, testosterone is a gendered political technology.

In this presentation, I want to show how some trans* activist collectives in the Spanish state are opening testosterone as gendered political object through questioning care practices related to trans health and opening

up the debate to the public sphere bringing some questions as: What means apply synthetic testosterone in the body? What is an appropriate dosage and for what? What are the effects and what are the non-desired effects?

Reproductive Technologies & Justice: A Dis/Ability-Queer-Feminist Ethics
Doris Leibetseder, IAS-STS, Graz, Austria

This paper contributes to the conference theme on *Social Change in Science and Technology* with a focus on biological reproduction and Assisted Reproductive (Genetic) Technologies. It fits in session 13: Queer Feminist Science, Technology and Society Studies.

Situated in the field of Gender Studies and Philosophy I create an allied queer-feminist ethics in my new project based on issues of biological reproduction with examples of dis/abled, transgender and intersex. I look at Assisted Reproductive (Genetic) Technologies (AR(G)T) and how they raise challenges for dis/abled, transgender and intersex people. My focus lies on the ways in which these technologies confront queer and dis/abled people with normative expectations concerning their biological sex, gender, sexuality, kinship and their right to procreate.

- My aim is to include non-pathologizing transgender, intersex and critical dis/ability issues in a queer-feminist ethics.
- find crucial ideas, challenges and further developments for a dis/ability queer-feminist ethics dealing with biological reproduction.
- with queer-feminist methods such as affirmative reading and diffraction, I develop an applied ethics in the Foucauldian sense of a postmoral ethics.

Questions are

- What principles are now relevant for reproductive justice in the wake of a paradigmatic shift, which conceptualizes the biological sex as constructed, and new bio-technological developments?
- What possibilities of intra-actions (according to Karan Barad's agential realism: 'mutually transformative interplays') concerning biological reproduction exist for transgender, intersex and dis/abled people and feminists?
- What new considerations arise for an ethics dealing with AR(G)T and these intra-actions

Queer Science and Technology Studies in Empirical Research – Ideas how to Implement Queer Concepts in 'Traditional' STS Research
Susanne Kink, Institute of Sociology, University of Graz; *Jenny Schlager*, AG Queer STS; *Magdalena Wicher,* STS/IFZ Graz, Austria

Meanwhile Science and Technology Studies (STS) are looking back on a long theoretical and empirical tradition. Therefore, from a Gender Studies perspective, the scientific working group Queer STS is interested in interrelating traditional approaches of STS with newer ideas of gender, in particular queer perspectives.

The original idea behind the term queer refers to the critics of heteronormative concepts, a binary, dichotomous gender order, sexual- and gender-norms, identity attributions that are seen as `normal´, hegemonial concepts of a dual sexuality as well as institutions and ways of thinking that are determining and use hierarchization and

binarization to marginalize. In our sense `queerness´ - above all - not only has to do with sexuality and gender, but goes beyond that. With reference to Degele (2008, 2014) it is about queering traditional methods and reassessing their unquestioned and not reflected naturalizations and mechanisms of exclusion.

We implement a queering angle in our focus on science and technology studies. Our declared object of investigation includes normalization and hegemonial systems in science, science organizations and science policy as well as technology development, technological organizations and policy. Queer STS therefore shows how to enlighten and deconstruct heteronormative knowledge, assumptions and relations through a science critical and social critical perspective. In our focus there are not only – apparently – established binarities of sexes, but power relations, that are being justified through this binarity and on whom discrimination, stereotyping, marginalization and misuse of power are based on.

On the basis of empirical research examples we present our ideas of queering Science and Technology Studies and therefore illustrate how to apply our queer STS approach in empirical projects.

S14: MUSIC, MATERIALITY AND SUBJECTIVITIES

Chairs: *David Waldecker*, Research Training Group "Topology of Technology, Technische Universität Darmstadt
          Martin Winter, Institute for Socioloy, RWTH Aachen, Germany

The Configuration of Knowledge and Material Tools in Art Music Composing
Martin Niederauer & Tasos Zembylas, Institute for Music Sociology, University of Music and Performing Arts, Vienna, Austria

In our presentation we will elucidate the configuration of knowledge and material tools in art music composing in order to deepen our understanding of artistic practices. Practices contain a temporal, corporeal and material dimension. Taking the process of art music composing, for example, some composers work with instruments or rewrite software programs so as to invent new sounds. Furthermore, composers use different materials (e.g. different papers, pencils) to visualize and give their ideas a concrete form via notations or drawings. In all these practices, we find various ways of using material tools that are informed by composers' theoretical but also practical, experiential and corporeal knowledge. Hence we can identify a configuration of various *forms of knowledge* – ranging from explicit knowledge to tacit knowing – and *material tools*. This configuration is efficacious, affording and generative; it initiates and sustains artistic creative processes. Because knowledge and tools are per definition socially shared, this configuration is always embedded in socially established musical practices and in concrete, context-bounded situations. However, it is the practical use by certain individuals that can challenge or change the socially shared knowledge and tools and thereby add something new to the practice collective that composers are part of.

Our presentation is based on empirical material from the research project "Tacit Knowing in Musical Composition Process". It consists of five case studies, in which the composition process was documented from the beginning of the work up until the last rehearsal. The data set includes composition diaries, various sketches, interviews, and participant observation during rehearsals. Additionally, we carried out 15 interviews with other composers.

Golden Ears and Wooden Ears – Knowledge and Learning Arenas of the Audiophile Community
Anita Thaler, IFZ/STS, Graz, Austria

This paper analyses informal learning arenas of audiophiles and asks which knowledge is relevant to be regarded as a member of the community.

Audiophiles listen to recorded music and pursue (by setting up their "perfect hi-fi-system") a listening experience, which should be as close to a life-sound as possible. The aim is to hear the music as it was performed or intended by the artist (O'Neill 2004).

Several studies confirmed that audiophiles are mostly well-educated men with incomes above average. In a survey from 1988 audiophiles reported to follow at least one of the community-typical periodicals like "Audio", "Stereophile", and "The Absolute Sound" (Perlman 2003).

In former studies, audiophiles have been characterised as either „golden ears" or „meter readers" (Perlman 2004), whereas in German-speaking countries the term "wooden ear" is also used. Whereas meter readers refer to physical evidence and rely on technical scales and testing methods to set up and improve a hi-fi system, golden ears rely mostly on their individual abilities and especially on their accurate ears (in opposition to "wooden ears").

Whether the community will be distinguished in these two categories or others, it is apparent that audiophiles are not a homogenous group. However, "one thing that is valorised amongst all enthusiasts is knowledge" (Heward 2006, p. 25) and this is the main focus of this paper.

The previously described meter-readers stem often from a technological background (Perlman 2004) and therefor access knowledge previously gained in their formal technological/engineering/science education. The so-called golden ears are more often laypersons, who learn their relevant knowledge informally (about informal learning see for instance Marsick et al. 1999; Thaler 2010).

This paper will present insights from ethnographic research and the analysis of the magazine "Audio" to answer: where and how audiophiles can learn informally community-relevant knowledge, and which knowledge that is. For instance Jansson (2010) described this relevant knowledge as subcultural capital and explained how gendered notions of the hi-fi subculture lead to women's exclusion from the audiophile subculture.

The results show that magazines, internet-forums, hi-fi-dealers and fairs can be seen as informal learning arenas for audiophile knowledge. Additionally audiophiles meet others (e.g. in groups of regulars or friends who meet in their living rooms) and discuss hi-fi components, sound qualities of recordings etc., this can be seen as informal peer training.

In all informal learning arenas two kinds of knowledge could be observed: the objective body of technological and physical hi-fi-knowledge and the more subjective knowledge expressed in a language to describe individual listening experiences and hi-fi-system performances.

References:
Heward, Kelly (2009). A technology of their own: Anti-mass sentiment and the high-end audio community. Thesis. Simon Fraser University. Download: http://summit.sfu.ca/item/9760 [12.3.2013].

Jansson, Sara (2010). "Listen to These Speakers": Swedish Hi-Fi Enthusiasts, Gender, and Listening. In: Journal of the International Association for the Study of Popular Music, I@J vol.1, no.2 (2010). Download: http://www.iaspmjournal.net/index.php/iaspm_journal/article/download/332/555 [20.1.2015].

Marsick, Victoria J., Volpe, Marie & Watkins, Karen E. (1999). Theory and Practice of Informal Learning in the Knowledge Era. In: Advances in Developing Human Resources, 1, 80-95.

O'Neill, Brian (2004). Listening Spaces: Audiophiles, Technology and Domestic Music Listening. Download: http://arrow.dit.ie/aaschmedcon/2/ [20.1.2015].

Perlman, Marc (2003). Consuming audio: an introduction to Tweak Theory. Download: http://www.tmgonline.nl/index.php/tmg/article/view/110 [20.1.2015].

Perlman, Marc (2004). Golden Ears and Meter Readers. The Contest for Epistemic Authority in Audiophilia. In: Social Studies of Science October 2004, Vol. 34, No. 5, 783-807.

Thaler, Anita (2010). Informal modes of technology learning and its gender implications. In: Proceedings of the 9th Annual IAS-STS Conference on Critical Issues in Science and Technology Studies 2010. Download: http://www.ifz.tugraz.at/ias/IAS-STS/Publications/ [12.3.2013].

Listening for the Hiss: Recording Aesthetics and Listening Modes in Lo-Fi Music
Alexandra Supper, Department of Technology and Society Studies, Maastricht University, The Netherlands

In this paper, I want to analyse the recording aesthetics of so-called lo-fi musical practices. Musicians engaging in these practices deliberately eschew state-of-the-art technologies and high-fidelity recordings in favour of supposedly obsolete recording technologies, which many of them associate with more authentic approaches. Technical flaws and artefacts in the recordings, such as distortion and tape hiss, are often described as characteristic of lo-fi music. However, I want to argue that lo-fi music is not merely defined by the presence of such artefacts and imperfections, but also by an aesthetic which deliberately draws attention to them. Lo-fi musicians often acknowledge the materiality and technologically mediated nature of music; rather than regarding recording technologies as neutral machines or vessels, they view them as musical instruments or even co-performers. In his way, they undermine traditional notions of recording transparency (the belief that a recording can accurately capture sound, without altering it in any way) and train their audiences not to indulge in the illusion of a transparent recording. Drawing upon the work of Jonathan Sterne, I show that lo-fi music is embedded in particular 'audile techniques' and invites specific modes of listening: listeners are asked to listen *for* rather than *past* the hiss and imperfections. Album liner notes that draw attention to the lo-fi character of the recordings play an important role in constructing such genre-appropriate modes of listening, and therefore constitute my primary empirical material for this study of the materiality and aesthetics of musical practices.

Aural Monads: Headphones, Music's Material Qualities and Public Space
David Waldecker, Technische Universität Darmstadt, Germany

Headphones have moved from the parlors and living rooms of the early 20th century to the streets, trams and offices of the 21st. Their usage changes the way we perceive and use music and public places at the same time. They have become so fashionable that they are sold at clothing stores and boutiques. Headphones allow for the

creation of a private auditory bubble which gives individuals some control over their sonic environments. In symbolically blocking the ears, they also change how individuals interact in public or semi-public places.

Based on ethnographic research and qualitative interviews conducted in the Rhein-Main area in 2011/12 as well as work by DeNora, Bull and Adorno, this paper shows how the specific usage of an everyday technology modifies the boundary between public and private space as well as what it means to listen to music.

CT: TRANSITIONS TO SUSTAINABILITY / ENERGY

S16 (1): LOCAL INNOVATION IMPULSES AND THE TRANSFORMATION OF THE ENERGY SYSTEM

Chair: *Gerhard Fuchs*, Institute of Social Sciences, University of Stuttgart, Germany

The Role of Local Bottom-Up Initiatives as "Change Agents" of Energy Transition
Rüdiger Mautz, Soziologisches Forschungsinstitut Göttingen an der Georg-August-Universität (SOFI), Germany

Renewable energies widely disseminated within the paths of decentralized diffusion systems where local actors often played a predominant role – as developers, early adopters and/or users of an innovation. This especially holds true for the early dissemination of renewable energies in Denmark or Germany. Despite the since long continuing professionalization of the renewable energy sector local bottom-up initiatives from civil society still play an important role as "change agents" (e.g. in Germany, Austria or the UK), displaying a wide range of innovative social practices in the field of energy transition. What we can observe here is on ongoing differentiation of institutional forms, organizational targets and roles of actors involved in local activities concerning the implementation and/or spreading of renewable energies.

The proposed contribution discusses key success factors as well as obstacles for local innovative practices in the field of energy transition, putting a special emphasis on local actor constellations and forms of governance as well as on the availability of inner-organizational resources of action. A theoretical point of reference will be transition theory, whereby the paper will put an emphasis on the issue of niche-regime interaction and discuss the conditions under which local bottom-up initiatives could contribute to a regime change towards a novel energy system structure based on technological decentralization, economic diversity, societal pluralism and environmental sustainability.

From Visions to Pathways: A Community Perspective on Localising the Future Energy System
Jose A. Mawyin, Physics Department, University of Sheffield, United Kingdom

Group of common interest are forming as awareness increases about the benefits of owning renewable energy generating technologies and exporting electricity into the grid, and the changes in lifestyle needed to ameliorate the effects of global warming. Members of these groups wish to change the localities where they live as to better conform to individual and collectively negotiated visions-of-change. Energy efficiency and renewable energy generation schemes are seen as pathways towards the sought after change of their localities.

Every renewable energy project is unique because they are developed within local constraints of the renewable resource, geography, funding availability, human capital, infrastructure, etc. Local initiatives are guided by what is desired but constrained by what is feasible. The initial wide range of ideas of what to do is narrowed down as economical and physical constraints apply a selective pressure on all proposed pathways. How do groups choose a pathway, ending in technological intervention, to follow when developing projects? How does this pathway compare with the initial visions-of-change, and what can we learn about what kinds of changes are currently enabled in the UK by looking at the narrowing-down process?

This paper will discuss this process of adaptation from vision to pathway in the context of the evolution of a group of interest formed with the desire to "change" the fabric of a town. This discussion is based on the presenters' participation in a 2 year project that aimed to co-develop renewable energy projects with residents of a town in the UK.

Performative Connections: Sustainable Transition and Local Communities
Ivano Scott & Dario Minervini, Department of Social Sciences, University of Naples "Federico II", Italy

The debate on sustainable transition is characterized by the confrontation of the multi-level perceptive and the social practice theory. Both attribute great importance to the micro level in the analysis of the green innovation but how local communities can manage or adapt the sustainable transition process seems less analyzed. In this respect, the study of commons by the approach of the institutional analysis and development offers important insights on this topic.

Based on these theoretical reflections, we try to propose an analytical hypothesis according to which the formal regulation of the ecological transition in some circumstances may be translated by *performative connections* with the constitutive elements of local community in an unpredictable eco-efficient and fair way. In short, we suppose that in some circumstances communities can translate the regulation patterns of the ecological modernization expressed by the governance of energy incorporating the dimension of socio-environmental justice.

In order to test our hypothesis, during 2013 we carried out an exploratory research on the community of Castalda Sasso, a small mountain municipality in the Basilicata region, Italy. This case-study seemed interesting to investigate because this community implemented environmental-energy local policies that seems hybridized the social local regulations with multi-level governance of the sustainable transition.

Initiatives as Drivers for Change? Actor and Space-Specific Field Formations in German Energy Regions
Nele Hinderer, Institute for Social Sciences, Department of Organizational Sociology and Innovation Studies, University of Stuttgart, Germany

Important technical and institutional innovations for energy transitions were and are being developed, tested, and brought to application on local levels. The objective of this paper therefore is to analyze the action of local Initiatives as so called "challenger actors", who establish specific structural and organizational designs of regionally located governance in the field of energy transitions.

Research is based on a comparative case study research design, using primarily expert interviews and document analysis as data sources. The cases demonstrate that sustainable energy transitions are driven forward by a variety

of actors with different aims and interests, culminating in the development of space-specific technological mixes and situative governance structures. Sustainable energy transitions are not following a master plan or are coordinated on a national level.

According to the theory of strategic action fields (Fligstein/McAdam 2011, 2012) the requirements for structural changes are depending on a collective construction of threat or opportunity as a starting point of organizational appropriation depending on actors violating field rules with respect to acceptable practices and engaging in "innovative action" in defense or support of group interests. So called Challenger actors are able to sense an opportunity to use new methods to advance their position in the field and are thus likely to engage in innovative action and sustain mobilization. Then they slowly begin to institutionalize new practices and rules and use opportunities of intentionally bringing forward deeper structural change.

Deploying Smartness in Energy Grids through a Co-Design Aapproach at the Urban District Level
Osman Arrobbio, Dario Padovan, Valentina Moiso, University of Turin, Italy

Smart grid is a process of defining and developing intelligent control technologies that promotes a specific actor network configuration in the energy chain in order to coordinate production and consumption in a self-balancing energy system. Conflicting interests and objectives among actors involved make difficult to realign and bring together providers, intermediary managers and end-users: then, despite the plethora of R&D and demonstration projects, only little has been achieved and smart grids are very weak in performance.

At the same time, the integration of information technologies and sensors allows the collection of an increasing amount of data: finding good places and roles for data and sensors is a key challenge to deal with if the deployment of smartness in energy systems has to be achieved. Following this idea, in this communication the results of a qualitative research centred on a district heating system will be discussed. Fifty interviews and six focus groups have been carried out in Turin (Italy), in order to mapping the features of the human actants, the current as well as the imagined technical devices, the relations linking all of them with each other, the problematizations they are carrying on.

Smart Cities Stand Up While Smart People Drive Fast
Stefania Pizza, Università "La Sapienza" di Roma, Italy

One of the biggest limitations of the Smart City model is the impossibility of finding a precise and shared definition. So the concept could lose its impact on reality. There are in the literature different definitions of smart cities. Many of them are "tecnology oriented": imagine a city more efficient and totally digitized. Other authors hope to achieve a city that is creative that is based on its human capital. The smart city does not have to be configured as a new tool of control, a sort of "big brother 2.0", but as a system of monitoring of social behavior to improve people's lives. Technology must be seen as a instrument that people use to meet their social, cultural and economic needs. As we know technology is socially determined and for this reason the new technologies used in smart city must be accepted by people to work well and to be useful, and come into their daily practices to satisfy their individual and social needs. Therefore, we propose an overview of smart mobility, in particular we focusing on those urban practices increasingly common that start by citizens and city users: car/bike sharing and car pooling. Because only thanks to smart people's behavior and choices we can realize the smart cities.

Sustainable Housing and Energy Poverty
Andrea Höltl, Tania Berger, Anna Faustmann, Danube University Krems, Austria

Amongst other requirements, sustainable housing means that windows and doors do not let in draught, a dwelling is free from mould and dampness, a building is well insulated, there is an efficient heating system, and people can keep their home adequately warm during colder periods. In Austria a significant proportion of dwellings fail to fulfil these criteria, therefore the requirement for building renovation is immense.

Under these circumstances, households at risk of energy poverty live mostly in buildings which are not sustainable. In our research project we investigated the living and housing conditions of affected households. The lifestyle of these households can be generally described as very modest - for instance, turning the heating temperature below 20 °C or heating only one room. Consequences are often dampness, mould and health troubles.

While tenants may favour building and dwelling renovation, they are concerned that such improvements will lead to increased rents. Thus, households at risk of energy poverty are often not interested in building renovation, and landlords keep dwelling in unsustainable state of repair, even without a heating system, with the intention to being able to offer cheap dwellings to tenants who cannot afford a higher rent.

In this context, the results of the research project redeEn!, which focuses upon the living and housing conditions of households at risk of energy poverty in two regions in Lower Austria, will be presented.

CT: TRANSITIONS TO SUSTAINABILITY

S17: DE-CONSTRUCTING THE SMART CITY, REASSEMBLING URBAN LIFE

Chairs: *Michela Cozza, Giusi Orabona, Giacomo Poderi, Maurizio Teli*, University of Trento, Italy

From Smart City to Smart Citizens, How to do It? An Empirical Case Study of Mediated and "Disintermediated" Participatory Citizenship
Tatiana Mazali, Politecnico di Torino, Italy

The paper presents the results of an ethnographic observation conducted within the project of active citizenship called *IRENCollabora*.

Iren is an Italian multiutility (electricity, energy, water and waste services), it operates for different territories and the public administrations.

Iren has recently taken measures to involve citizens in "improving the quality of their services" through the provision of local committees. The committees are composed of stakeholders representative of the territory. In

order to expand participation Iren has launched the online platform *IRENCollabora* for the widespread involvement of "common" citizens.

IRENCollabora is therefore a mixed format of territorial involvement. It consists in an online consultation, open to all citizens (based on the model of "disintermediated" participatory online citizenship), flanked by a model of deliberation "mediated" by a group of civil society representatives. The combination of these two instruments is specific — and therefore precious in analytical terms — of the case study that the paper intends to present analytically.

I will discuss the issue of *"hybrid" community*: In recent years has emerged the concept of "community of proximity", which now includes not only the persons belonging to the same territorial or social condition, but all those who work for the global resolution of a problem thanks to the network and the 2.0 ecosystems. "Hybrid" means the union/tension between online and offline identities and online and offline decision-making practices (mediated and "disintermediated" at the same time).

Invisible Citizen? Exploring the Imagined Residents of a Smart City

Olesya Benedikt, Goethe University, Frankfurt on Main, Germany
Nikolaus Pöchhacker, Institute for Advanced Studies, Vienna, Austria

Smart Cities are often understood as urban spaces that reduce their carbon footprint, efficiently use energy and incorporate effective transport systems. To achieve these goals a vision of an innovative, networked and data driven society came to life … the smart city. However, it is not clear yet what a smart city should or can be, nor how such a smart city co-evolves with and from its residents. The question, which new forms of behaviour or social practices are necessary to achieve these goals is hardly asked. Users and citizens tend to be forgotten in these scenarios. The understanding of *smart citizens* remains implicit.

The presentation explores these ideas by investigating two case studies - Vienna's Smart City Initiative and the Smart City of Songdo. By taking a look at the presented ideas and ideologies in official documents and opening up the negotiation process that involves different actors – such as ICT corporations and policy makers – the implicit understanding of a smart citizen in different cultural contexts will be explored. Smart Cities represent a contemporary sociotechnical imaginary of a highly data driven and optimized city. At the same time it creates a vision of tomorrow's cities. Therefore one question must be raised: A smart city for whom?

New "Technological Élites" as a Tool for the Citizens-Relationship Management in the Smart City. The City Project in Bologna

Valentina Bazzarin & Pina Lalli, Department of Political and Social Sciences, University of Bologna, Italy

Aim of this research is to use an empirical case in order to critically analyse the definition of a smart city ecosystem. We will focus on Bologna (Italy) and on the engagement actions planned in the "icity" project funded by the European Commission. Icity main objective is to identify new ways of collaboration using new technologies. Citizens are supposed to promote the civic demands to access public information to re-use it as well as to explore other ways of offering public services that usually are guaranteed by public administration only. In particular, icity aims at building a common platform where "civic hackers" could realize a progressive crowd-working to create smart application. Since January 2014 we observed the engagement actions run by the Municipality of Bologna.

We attended five so-called "engagement meetings" in Bologna, we observed the participation processes in the on-line social platforms and we interviewed in depth four participants. Moreover, we are considering the parallel on-going process in which the civic network of the City of Bologna "iperbole2020" is updated and re-designed, in order to compare the activities of participants in the two processes. Our results show that although icity project partially failed in its technological aims, it is succeeding in raising, engaging and mobilizing an important group of people: what we called a "new elite of technological citizens". In this project we can identify a "skilled citizens-relationship management" able to develop both social capital - bridging the elite of technological citizens with some local schools, for instance - and bounding a new community of civic hackers as a new type of social influencers. Concluding we can say that icity project in Bologna catalysed the reassembling of urban social networks even failing in its technological determinism. The long tail of this project could promote a widespread digital empowerment, especially if its promoters will be aware of their role as curators and managers of the network relationships of the "new technological elite".

"Smart" Global South Cities. Will They Really Leapfrog

Gynna Millan, School of Business and Management, Queen Mary University of London, United Kingdom

In 21st Century urban planning, the term 'smart cities' is frequently bandied about. It's the ultimate urban utopia of many policy-makers in the UK and elsewhere in the West. These are mainly data-driven cities where, through innovative ICTs, citizens feed the cities' databases with raw data about how they live, work, play, what they need, and what they want, and the super-computing city responds by providing the required services efficiently and (presumably) fairly.

There are two problems with this objective, as it is currently formulated. Firstly, a smart city doesn't necessarily require that its citizens are meaningfully engaged, and fairly treated. Rather, it follows the utilitarian principle. And secondly, there are vast swathes of urban areas in the majority world that are infrastructurally 'underdeveloped' and economically excluded from the smart city mechanism, meaning that until such infrastructure is established, either governments alternative models of service-delivery and citizen engagement must be found.

The driving questions to explore in this presentation therefore are a) are there ideas and mechanisms within the smart cities agenda that are available to infrastructurally and economically excluded urban areas in the Global South? b) what local information and communications technologies can facilitate both better urban planning and service delivery, and representative citizen engagement in these communities?

S19: STS – DESIGN – SUSTAINABILITY

Chair: *Stefanie Egger*, STS / IFZ, Graz, Austria

The Barriers and Pathways to Ethical and Sustainable Mobile Devices
Nicki Lisa Cole, IAS-STS, Graz, Austria

What are the current socio-structural, cultural, governmental, political, economic, and design barriers to the ethical and sustainable production of mobile devices? I will present a sociologically informed review of existing barriers based on my in-depth study of the hidden human and environmental costs of Apple's supply chain, including focus on how design impacts obsolescence, turnover, and waste. In addition, I will draw on interviews and fieldwork with researchers, activists, political stakeholders, and members of ethical companies to illustrate ways in which some are already pushing past these barriers to reconfigure the production of mobile devices; extend their lifecycle through design with repair in mind; and, efforts to teach consumers how to repair them. I will close by offering sociologically informed suggestions for how these barriers and design issues could be addressed on a larger scale.

"How Should We Live?" Participatory Research and Design Methods for More Sustainable Behaviour in the Next Generation
Ulrike Haele & Marco Kellhammer, IDRV- Institute of Design Research Vienna, Austria

What role can design play in formulating economic and social artefacts for a sustainable future? What is needed in order to close the gap between knowledge and action? One key concern is winning wider acceptance for the change towards more environmentally and socially sustainable ways of life. The focus is on students aged 14 to 17 years, since they will be the consumers and citizens of the future. The starting point is an expanded design concept, which moves away from specialization and towards improvisation; away from specific solutions to problems and towards the discovery of new opportunities.

This project can be seen as a multi-step research process at the intersection of scientific and creative practices. We propose involving the future users by exploring their usual behavior and consumption practices and analyzing the environmental impact. The collected data forms the basis for informed design decisions. Moderated by the IDRV, the "non-designers" will work with designers on a specific "intervention" for a relevant aspect of their everyday lives. What aspects of a simpler and less resource-intensive life can be designed collectively? Independent thinking and self-empowerment will be the guiding principles for the young researchers and co-designers.

This presentation introduces the "How should we live?" project, carried out under the Sparkling Science program, supported by the Federal Ministry of Science, Research and Economy.

Designing for Sustainability: Shape Sustainable Meal Communication Concept
Heidi Uppa, Marja Seliger, Danielle Pichlis, Sofia Pusa, Mikko Raatikainen, Marjo Kauppinen, Aalto University, School of Arts, Design and Architecture, Espoo, Finland

Food is an everyday necessity, which has major environmental implications globally. Consumers make many food-related decisions unconsciously and unsustainable behaviour patterns exist, because complex relations of the food chain are difficult to understand and change. Social innovations are needed to solve wicked problems, such as creation of ecologically friendly food chain. The purpose of our design case is to make ecological consequences of the food chain and individuals' decisions more visible and understandable to consumers. We wanted to explore how design and communication can contribute to support behaviour change towards more sustainable practices.

Our multidisciplinary team developed a communication concept for sustainable eating. We used service design methods for providing solutions related to lunch catering in Finland. Participatory and co-creation methods (particularly design games) were applied during the design process to develop a communication concept and a prototype for a mobile application. Our findings address that design can support sustainability in many ways: for example, in defining the context and in framing the problem, in supporting end-user's decision-making processes by providing useful information, and by making sustainable solutions more usable and appealing for consumers.

Although this project is still partly on-going, we can conclude that design research and visual communication combined with information technology and HCI approach can contribute in solving problems related to sustainability and behaviour change. With this design case we are able to exemplify how to make complicated cause–consequence structures more visible and understandable for the consumers.

Technology and Social Innovation: An investigation of the Bikehare Domain
Robert Bradshaw & Leighton Evans, NIRSA (National Institute for Regional and Spatial Analysis), Maynooth University, Ireland

Contemporary or "smart" bike share schemes have exploited the capacity of information and communications technologies to effectively automate systems and deliver improved mobility and convenience for citizens in a way that is both sympathetic to the environment and cost effective for service providers. However research in the sector has tended to view schemes as technically homogenous and uniform in character, with little attention paid to the potential of creative design to deliver on goals which transcend quite narrow definitions of efficiency and sustainability. As the industry develops and new concepts emerge, creative design has the potential to integrate riders in knowledge sharing and decision making practices which frame them, not as passive recipients of information and services, but as active participants in the creation of the systems they appropriate.

This paper reports the findings of two case studies designed to explore these themes. Using a critical perspective derived from constructivist technology studies we argue that the architectural and ideological content of systems is not technically determined but is a product of the socio-cultural milieu within which the design and implementation processes occur. These processes in turn are conditioned by, and reflective of, the goals and expectations of dominant institutional and bureaucratic actors. Accordingly our analysis demonstrates how design supports the way of life of one or another influential social group and how these processes are related back to the implementation strategies and design parameters of the schemes.

S20: FROM VICIOUS TO VIRTUOUS PRODUCTION CHAINS: TRANSFORMING EUROPEAN SMES TOWARDS CIRCULAR ECONOMIC BUSINESS MODELS

Chairs: *Cor van Leeuwen*, Rotterdam University of Applied Sciences, The Netherlands
Rengenier Rittersma, Rotterdam Business School, The Netherland

Flowing in Circles

Heico van der Blonk, Mikhail Nimilentsev, Clemens Bernardt, Alex van Spyk
Hanze University of Applied Sciences, School of Business Management, Instituut Bedrijfskunde (IBK), Groningen, The Netherlands

In our contribution to the conference we focus on the energy transition as it is happening right now in the Northern Netherlands. A new group of businesses has emerged and is growing rapidly: Decentralized Energy Businesses, presenting a clear alternative to the more established larger energy companies in the Netherlands and in Europe. These businesses as well as the communities to which they are linked focus only on renewable energy and sustainable solutions that suit their local or regional needs and capabilities.

To describe this emerging reality we are using the model of the Circular Economy as outlined by the Ellen MacArthur Foundation as well as the Cradle to Cradle principles. Rather than emphasizing products and production we have adapted the model to focus on flows (such as energy, water, bio-materials and waste).

Our research group at the Hanze University of Applied Sciences closely collaborates with a network of two groups of Small and Medium-sized Enterprises (SMEs), which are (1) the Decentralized Energy Businesses and (2) the local companies supplying technological products, installation and other services and consultancy. As part of our approach SMEs play active roles in the research itself. Besides businesses, various governmental organizations and representative/advocacy organizations are also closely involved.

This conference paper aims to explain how our curriculum development is informed by these SME business practices and applied research concerning the application of the model of Circular Economy to the energy transition that is currently unfolding in the Northern Netherlands. We will discuss the outlines of, a new course on Innovation Management including opportunities for an international project (with MAMK Finland) concerning Circular Economy (part of the bachelor of Business Management). We will also discuss a project around Energy Transition for 2nd year Master students of Architecture. Thirdly, we have been working with junior researchers & students in individual graduation research projects. At the conference, we would like to share our experiences as well as learning form others in the session workshop.

Reshaping Food Education. Sustainable Meals in Traditional Organizations

Dario Minervini , Università di Napoli; *Valentina Moiso* & *Elena Pagliarino*, CNR-IRCrES, Università di Torino, Italy

This on-going research deals with a public procurement alimentary programme consisting in the introduction of fresh local fish into the primary school canteen. The scenario is characterized by the involvement of organic and local producers with a substantive reassessment of the traditional food catering chain. In line with the STS sensitivity, the main aim is to trace how the reconfiguration of the action-net developed by the food programme is enacted. The catering chain, the collective learning relations and the organizational changes are investigated.

In this "extended" unit of analysis, pupils (and their agency), learning devices, relations among professional (from the dietician to the cook) are included.

Ethnographic observation of the canteen including the shadowing of the actant "fresh fish" (from the farm to the children's plate), solicited diaries kept by professionals and pupils, interviews to institutional actors, are the empirical sources of data.

The provisional findings are organized around the main criticalities and ineffectiveness emerging from the project planning. In particular, misalignment between the working practices in the meal preparation, affected by a specific legislation, and the consuming practices in the school canteens emerges. This creates a fall in the translation of meal qualities through the food catering chain, partially frustrating the collective learning process enacted.

Findings for Educators and Companies: Minor Circular Economy in the Cloud
Cor van Leeuwen & Rink Weijs, Rotterdam Business School, The Netherlands

INTRO
The Europe 2020 agenda aims at stabilizing the European economy after the global economic crisis and at setting out a vision for Europe's social market economy in the 21st century.
The Europe 2020 agenda puts forward three mutually reinforcing priorities:

Smart growth, Sustainable growth and Inclusive growth
The international mission, network and student population base of many HEI's make these institutions perfectly suitable for helping European companies to run their (future) business (more) efficiently and sustainably. Sustainable growth and innovation must have a circular economy focus and include product innovation and organizational/ business model innovation.

In collaboration with two other Dutch Applied Universities the Rotterdam Business School designed a minor with a focus on the circular economy concept. As to Dutch Applied Universities, this minor contained three innovative features: content (Circular Economy), the MOOC-inspired format and the collaboration between three institutions in designing an accredited educational program.

In this minor the business case (i.e. the transition of one or more value chain related activities from linear to circular) of the participating companies was leading for the educational program.

OBJECTIVE
To present the findings of this novel part of an Applied University study program to representatives of companies and Higher Educational Institutions in order to stimulate participation.

OVERVIEW OF TYPES OF FINDINGS
An overview will be given to summarize the drivers, barriers and enablers for organizing, implementing and using the minor.
The following topics will be addressed:

- Acquisition (strategy) of the companies.
- Contents of the minor
- Key features of the Moodle platform.

- Evaluation data from three stakeholders: students, lecturers and companies.

Key points will be listed and discussed to improve the quality of the minor with respect to the above mentioned topics.
Finally, based on our experience some thoughts are expressed to make this practical minor available on the European (and later even global) 'market'.

Will it Go Round in Circles?
Ken Webster, Ellen MacArthur Foundation, Isle of Wight, United Kingdom

The basics of a circular economy are easily understood and support is becoming widespread. However, a circular economy is a systems perspective and is not captured by calls for resource efficiency and waste reduction. The meaning is dependent of grasping the opportunities for a regenerative economy which encompasses all flows of energy materials and information

S21 (1): ENERGY, SOCIETY AND CULTURE – (SUSTAINABLE) ENERGY TRANSFORMATIONS AS TRANSFORMATIONS OF SOCIAL ORDER

Chairs: *Martin Schweighofer,* Energy Cultures Research Group, Zeppelin University, Friedrichshafen, Germany

Energy Cultures, Sustainability, and Epistemic Governance – A Framework
Thomas Pfister, Sarah Glück, Mirko Suhari, Martin Schweighofer, EnergyCultures Research Group, Zeppelin University, Friedrichshafen, Germany

This paper aims to contribute to the debate about how the relationship between energy and society needs to be reimagined in order to aide transformations towards greater sustainability. The main focus is on developing a framework for understanding energy, energy systems, and energy use as pivotal elements of socio-material order. At the centre of this framework, it suggests a conceptual repertoire for analysing 'energy cultures'. This notion is elaborated in relation to and as extension of promising discourses analysing energy transformations as questions of *sociotechnical* change. It is argued that a cultural perspective is most capable to develop and to integrate narratives about the complex and contested overlaps between energy and society.

On this basis, the discussion enquires how energy cultures could become more sustainable and the possibilities to govern such a process. At the beginning of this discussion stands another challenge that is implied by the perspective on energy cultures: If one adopts energy cultures as a novel idiom to accept and to understand the complex entanglements between energy and society, we also require new repertoires to envision alternative energy cultures and to negotiate how they could be reached. Governance is always based on particular bodies of knowledge and particular practices of knowledge creation. Governing shifting energy cultures will, therefore, also be knowledge intensive. In particular, the social sciences could play an important role in order to make energy cultures visible, to suggest alternative energy cultures and to facilitate societal debate about their respective value and potential strategies to get there.

Energy Transitions as Transformations of Power Relations. Learning from Dispositive Thinking and Governmentality Studies?
Ludger Gailing, Leibniz Institute for Regional Development and Structural Planning (IRS), Erkner, Germany

Energy transitions bring about changes in the infrastructural energy system as well as in the social sphere. These changes crucially touch upon existing power relations. Thus, studying the social order through the perspective of the energy system should include an understanding of "power". On the one hand, power in energy transitions plays out overtly, for example in the form of policies supporting renewable energies. On the other hand, power is a decisive factor in energy transitions on a more subtle level: discourses concerning renewable energies or other aspects of energy transitions have an effect on how individuals fashion themselves into subjects and this affects the role they assume in the whole process.

The paper presents findings from a research project about socio-materiality and power in energy transitions. Dispositive thinking and governmentality studies will be discussed as two promising approaches to conceptualize power relations. Both fields of scholarship are rooted in the original work of Michel Foucault. Whereas dispositive thinking is important for the understanding of the co-production of material and social phenomena, the concept of governmentality has been used as a critical framework for the analysis of societal transformations and governance systems. The value of the two approaches in analyzing energy transitions will be illustrated with empirical cases from the German Energiewende: energy autarky around a rural waste-to-energy initiative and the development of wind energy sites in an "energy region". The paper concludes with remarks about the limits and possibilities to govern sustainable energy transformations.

The Mutual Transformation of Energy and Spatial Mobility? The Electrification and Smartification of Transportation
Alexander Wentland, Technical University Berlin, Germany

The automobile is often regarded as the quintessential artefact of late-industrial modernity, an iconic motif in popular culture, and for the vast majority of the population, it is an indispensable part of everyday life. Today, international climate conventions as well as the general trend towards sustainable technologies have put unprecedented pressure on both governments and car manufacturers, not just to develop and deploy new technologies, but also to tell new stories that reimagine space, mobility, and social life. The range of possible innovations stretches from sophisticated charging systems that integrate "smart" electric vehicles as "swarm batteries" into the electrical grid to plans that envision future mobility as an interconnected, multi-mode system of various means of transportation beyond the personally owned car. I will argue that the increasingly dominant visions of the electric car have shifted away from a mere substitute for conventional vehicles. Electrified mobility has become a field of discourse far beyond the automobile, where – often implicit – questions of urban planning, (energy) autonomy, (de-)centralization, participation, privacy, and social control become more prevalent. That raises crucial questions with very practical consequences: What configurations of actors, artefacts, and discourses are associated with what kind of future? How are forms of social life and social order reflected and enacted within such scenarios? I draw upon two years of fieldwork in Germany and the US, using a mixed methodology of document analysis and multi-sited ethnography.

S21 (2): Energy, Society and Culture – (Sustainable) Energy Transformations as Transformations of Social Order

Chair: *Thomas Pfister,* Energy Cultures Research Group, Zeppelin University, Friedrichshafen, Germany

The Quest for Citizen Governance of Energy Resources
Tineke van der Schoor, Hanze University of Applied Sciences, Groningen; *Harro van Lente*, Faculty of Arts and Social Sciences, Maastricht University; *Alexander Peine*, Copernicus Institute of Sustainable Development, Utrecht University, The Netherland

In the Netherlands more than 500 local initiatives seek to reshape the energy system, in the face of constraints embedded in technical, cultural, economic and political traditions. Increasingly, these local energy initiatives team up in regional and national networks.

In this paper we investigate the formation of these new networks, both in the North of the Netherlands and on the national level. We trace how they channel demands for more democratic control of energy resources from local communities to the national government and how they negotiated the Dutch Energy Covenant.

Our analysis combines Actor-Network Theory (ANT) and Social Movement Theory (SMT), to allow a dynamic analysis of collective strategies. ANT is mobilized to carefully describe the local and regional networks consisting of human actors as well as institutions, buildings, energy technologies and infrastructures.

Moreover, we employ SMT to study the development and activities of regional and national networks for community energy, positioning their activities as a quest for citizen governance of energy resources.

Our theoretical contribution is to combine SMT and ANT in the analysis of recent attempts to decentralize and decarbonize the energy system. While we used the microanalysis of ANT we also circumvented its myopia by tracing the national and regional networks that form the community energy movement. Likewise, we followed political moves with SMT without ignoring its blind spot: the technological embeddedness of social movements.

Our findings give new insights in the technical and political constraints the community energy movement encounters while transforming the energy system.

Local Organizational Changes as Element of the Energy Transition
Pia Laborgne, Institute for Sociology, University of Freiburg and European Institute for Energy Research/KIT, Germany

Cities are major context for the consumption of resources as well as centers for innovation and privileged level for experimentation and implementation of new approaches for problem solving. They are thus important starting points for sustainability transitions. These transitions are only in part technical ones but essentially embedded in, based on and consisting of social innovations. Following the definition by Zapf (1989), such social innovations can e.g. be changes in practices and forms of organization of societal problem solving.

The paper proposes a theoretical as well as empirical analysis of one central form of organizational change in local energy transition strategies: The creation of local intermediaries, defined by their function and position in-between other actors.

The presentation builds on findings from the work on a PhD thesis realized in the framework of an interdisciplinary researcher group on urban infrastructures (2010-2014) at the Technical University of Darmstadt and the University of Freiburg. It is applying the multilevel perspective which analyses transformations as interplay of three different levels: landscape, regime and niches. The thesis intends to enhance the empirical basis on local transformations. It analyses what kinds of and how local niche-experiments are created locally. Following Konrad et al (2004) such niches are defined here as new configurations of structural elements.

Case studies in major urban regions have been realized (Berlin, Frankfurt/Main and Ruhr Metropolis). The results are based on the analysis of semi-structured qualitative interviews with local actors and experts, a literature study, official documents and a media analysis.

Understanding Conflict within Renewable Energy Cooperatives
Judith Rognli, Institute for International Research on Sustainable Management and Renewable Energy (ISR), Nürtingen-Geislingen University, Germany

Due to reforms of the renewable energy act (EEG), renewable energy cooperatives in Germany are losing the feed-in tariff as their most important revenue stream for new projects. Subsequently, they need to adapt their business strategies to the changing environment.

This paper explores issues of power and identity at stake in the energy transition from a standpoint *within* renewable energy initiatives in Germany. It examines conflict concerning their organizational identity and their strategic decisions during significant political change.

Analysis draws on qualitative data collected through participant observation in annual general meetings of 15 cooperatives in 2014 and on semi-structured interviews with their members (ongoing).

We conceptualize renewable energy cooperatives as 'hybrids' between social-, ecological- and business enterprises (Huybrechts 2013). Hybrid organizations are regarded as important actors in societal transitions while facing very specific challenges: internally, hybrid organizations are prone to conflict regarding their organizational identity. Externally, it can be difficult for them to gain organizational legitimacy (e.g. as volunteer-run organizations in the business sphere). Finally, they are always at risk of 'mission drift', losing one part of their hybrid identity (e.g. the ecological part) in favor of another (e.g. the identity as a business organization).

By investigating these challenges through the analysis of conflict, we aim at gaining a better understanding for the dominant logics and societal power dynamics and their relevance on the micro level. We argue that in order to better understand the workings of power dynamics in the energy transition, we need to take micro-processes into account.

Publication bibliography
Huybrechts, Benjamin (2013): The Role of Networks in Gaining Legitimacy for Hybrid Organizations: The Case of Renewable Energy Source Cooperatives. Edited by UCL. Namur (1er Congrès Interdisciplinaire du Développement Durable. Quelle Transition Pour Nos Sociétés?).

Community Based Energy Use – Two Examples of Individual Innovations in the Daily Energy Practice
Petra Wächter, Institute of Technology Assessment of the Austrian Academy of Sciences, Vienna, Austria

Energy as the basis for daily activities on an individual level and for economic activities on a societal level gives fundamental importance to our lives. The paper wants to draw the attention on individual innovations in the daily energy practice. More concrete, two examples of the field are further explored: one deals with energy demand related to space by analysing possibilities that multifunctional settlements offer in the organisation of less energy intensive practices. In these multifunctional settlements, contact nodes are a valuable basis for the creation of a sense of community where personal contacts can be made and established which can foster the appearance of community based services aiming at less energy use. Moreover, these activities can be organized in a self-esteemed and democratic way. Multifunctional settlements provide a chance to enhance a less energy-intensive lifestyle also by different mobility patterns, different consumption habits and less energy consuming activities.

The other example focuses on the supply side of energy by analysing the engagement of communities in providing sustainable energy. Community based energy production has shown to be a valuable contribution to citizen participation in addressing sustainable energy issues. Decentralised energy models where energy is generated, stored and consumed locally provide a greater security and also quality of energy supply. Moreover, these energy projects are multi-faceted and they rarely address only one technology or one aspect of behaviour. These two examples show that the daily organisation of lives has large potentials for the shaping of energy transformations.

S22: ENERGY TRANSFORMATIONS, ENERGY EPISTEMICS, AND GOVERNANCE – THE ROLE OF THE SOCIAL SCIENCES AND HUMANITIES

Chairs: *Mirko Suhari,* Energy Cultures Research Group, Zeppelin University, Friedrichshafen, Germany

The Development of Energy Measures and Energy Statistics in the 19th and 20th Century
Daniela Ruß, Forum Internationale Wissenschaft, Abteilung Soziologie und Politik des Wissenschaftssystems, Bonn, Germany

Almost everything we know about our energy system and its problems depends on the observation and comparison of energy measures: Our economy is too energy intensive (i.e. it produces too little value with too much energy), energy consumption is unequally distributed (as shown by the energy gini index) and the mixture of fuels is not sustainable since forecasting shows demand cannot be met by resources anylonger. However, energy measures are by no means "natural" or "self-evident" – they have a socio-political history. The presentation traces the emergence and development of energy measures and energy statistics from the discovery of energy in physics in the 19th century and the early energetic theories of society around 1900 to the emergence of global energy statistics in the 20th century.

Drawing on work on governance (Foucault), quantification and commensuration (Porter, Espeland/Stevens), the presentation focusses on the question, how energy is made comparable and governable through quantification. Based on an increasingly intensifying net of energy measures and their comparison, energy evolves as a global problem in the 20th century.

Energy Epistemics as Drivers of Local Energy Transition
André Schaffrin, EA European Academy of Technology and Innovation Assessment, Bad Neuenahr-Ahrweiler, Germany

Over the last decades the governing of energy transition has witnessed significant changes with an increasing focus on the local rather the national level. Studies indicate the potential of local energy production for the creation of value and for the mitigation of greenhouse gases. So far, the majority of research is on best-practices, and the role of social sciences is rather one of an outside observer to provide objective descriptions of local processes. However, as local energy transition becomes a mainstream solution for local problems, increasingly complex and contested challenges emerge and block localized developments towards sustainable communities. These challenges are routed in social conflicts over different forms of land-use such as nature conservation, agriculture, etc. combined with cultural identities or localized values.

This paper discusses the potential role of social science (among other disciplines) to launch a process of cooperation between scientists (experts on land management, energy systems, governance, and participation) and practitioners (administration, regional politics, culture clubs, energy suppliers). Using the concept of an *innovation group*, social sciences contribute a transdisciplinary and participative instrument to provide conflict resolution within the on-going planning process of local energy transition in the county of Ahrweiler in Germany. Within this process, the innovation group tries to elaborate a jointly developed and commonly accepted concept of sustainable land use in the county. On that basis, the project aims to develop a general model of an epistemic, participatory, and scenario-based decision making process to meet major challenges of sustainable land-use and energy supply.

The Social Sciences and Humanities in the EU´s Horizon 2020
Sarah Glück, Energy Cultures Research Group, Zeppelin University, Friedrichshafen, Germany

An energy system transition is not purely technocratic. The transformation from a resource over-exploiting to an attentive and sustainable society is most notably a social and cultural question. Therefore the embedding of Social Sciences and Humanities (SSH) in energy research seems highly relevant to achieve the EU´s ambitious energy policy targets for 2030. The 8th Research Framework Program of the EU – Horizon 2020 – follows a twofold approach; besides the 6th Societal Challenge "Europe in a Changing World – Inclusive, Innovative and Reflective Societies", SSH is also integrated as a cross-cutting issue in all other Societal Challenges, including "Secure, Clean and Efficient Energy". So far the realization of interdisciplinary energy research projects including SSH are limited especially due to a lack of guidance. Researchers, National Contact Points as well as evaluators of potential research projects require mechanisms and an implementation plan to act upon. An additional perspective I want to draw attention towards are the different practices of knowledge production, the various epistemic cultures and understandings of a science-society relation relevant to the respective discipline, which may also be an impeding factor for interdisciplinary research projects between classical energy research and the SSH.

POSTERSESSION

What You Don't See Won't Hurt You? The Beauty and Challenge of Invisibility in Geothermal Energy Tapping
Alena Bleicher & *Matthias Gross*, Helmholtz Centre for Environmental Research, Leipzig, Germany

Local renewable energy projects are often contested simply for being seen, heard and smelled (wind-turbines, biogas facilities). Consequently, some research supports the view that designers of technology should take up the expressed wish to making technologies less visible. However, one particular source of renewable energy, geothermal heat and electricity, is "by nature" rather invisibly lurking in the deep. This invisibility, on the one hand, seems to be an advantage compared to other renewable energy sources. On the other hand, it not only fosters suspicion and fear, but the invisibility of the technologies involved is often seen as an obstacle for their development and diffusion. Installers thus seek for means and symbols in order to visualize and thus to promote energy from below. This is easier said than done, since geothermal operations are often perceived in connection with unfavorable events such as seismic activities or cracks in buildings. Visualization of the technology in its none-failure state hence seems to be a precondition to open debate on potential risks and advantages. Different strategies are employed in order to bring the invisible into public debate.

This presentation will focus on tensions between visibility and invisibility building on data from geothermal drilling operation planning and public debates related to it. Different forms of visualization of the invisible underground will be explored. It will be shown how actors react to different types of invisibility. Finally some differences in the perception of geothermal heat and electricity are discussed in comparison to other forms of renewable energy.

Diffusion of E-Bikes in Austria
Tamara Brandstätter, Nikolaus Pöchhacker, Erich Grießler, Institute for Advanced Studies, Department for Sociology, Vienna, Austria

E-bikes are perceived as zero-emissions vehicles and therefore transport the promise of sustainability and energy efficiency. However, this idea of e-bikes as a green innovation has been contested by several actors. Therefore the question must be raised, under what circumstances can such a technology become sustainable and what do we mean with that term in this context? What are the social dimensions of this seemingly green innovation? E-bikes can have function as enabling devices to foster a different kind mobility, not replacing other means of transportation but changing mobility patterns in urban settings. To understand the diffusion patterns and the integration of e-bikes in daily practices, infrastructural as well as design aspects need to be taken in consideration. The paper will give a short overview on the discrepancy between the design of e-bikes, the user's actual practices and values and how these design issues affect the diffusion patterns of this technology in the Austria. In addition we will explore in which ways e-bikes are acting as an enabling device offering a wider range of mobility options and foster healthier life styles.

E-Bikes are one of several energy innovations which have been analyzed with regards to diffusion patterns in the research project "EnInnovAT– Diffusion of energy innovations in Austria", funded by the FFG and the Austrian Climate and Energy Fund

Transforming Neighbourhoods: Home and Neighbourhood Sustainability for and by the Residents?

Sylvia Breukers, Ruth Mourik, Luc van Summeren, DuneWorks, Eindhoven, The Netherlands

Abstract is based on action research that we are performing for the Technical University of Eindhoven (TUe).
Prof.Dr. Geert Verbong (TUe)is supervising this research project.

In the Netherlands an optimistic policy discourse about self-organising collective action towards local sustainable solutions has become popular. In fact, it addresses citizens in a rather instrumental manner (as means to solve welfare state problems) and presents an image of the 'good citizen', implying that successful collective action depends on the willingness of 'good' citizens to mobilise and/or become mobilized to solve their own and others' problems. Research into success examples (e.g. energy cooperatives) to learn how these can be replicated as part of an energy transition, (unwillingly) serve this limited perspective as it also appears to presume the possibility of trickle down of successes into other neighbourhoods and localities. This paper focuses on neighbourhoods where there is very little collective action, where resources and capacities are limited and where a history of ongoing neighbourhood degradation is offering little hope to residents, many of whom are trying to move elsewhere. The empirical case reports how a housing corporation attempts at socially inclusive processes toward home- and neighbourhood improvement and the difficulties that arise, due to various path-dependent conditions that challenge any straightforward implementation of interventions that need to become socially and institutionally embedded within a neighbourhood. We investigate what is needed for such an external initiative (including financial investments) to be able to connect to and mobilise the capacities and enthusiasm of citizens/residents locally. The concluding section discusses why both policy and research need to become more attentive to both the institutional and local geographical conditions affecting local sustainability interventions.

Representations of Sustainable Energy in Italy: What Is Within the Picture and What Is Outside?

Sonia Brondi[1], Mauro Sarrica[1], Alessandra Armenti[2], Paolo Cottone[2]
[1] Department of Communication and Social Research, Sapienza – University of Rome, Italy
[2] Department of Philosophy, Sociology, Education and Applied Psychology, University of Rome, Italy

This study aims at contributing to the debate on societal aspects of energy transition (Hirsh & Jones, 2014; Gifford, 2014) by exploring figurative features of the representations of sustainable energy in Italy (see also Brondi *et al.*, 2014; Sarrica *et al.*, 2014). In particular, we examined 167 photographs sent by professionals to two photo-competitions, and 133 images produced by pupils (11 to 12 years-old) involved in a *photovoice* project in Narni (Italy). We draw upon social representations approach, which has been largely advocated for understanding lay-knowledge about environmental (Castro, 2006) and energy issues (Devine-Wright, 2005; 2009). Previous research conducted within this theoretical perspective showed that energy transition is mainly viewed in terms of techno-centric and eco-centric images. Images of natural resources (Leggett, 2003) as well as of renewable technologies, tangible and well-known technological objects (e.g. high voltage pylons) (Devine-Wright & Devine-Wright, 2009) abounded. Instead, humans as well as individual practices of energy savings or efficiency were invisible. Photographs produced by both professionals and youth were content analysed. Three main themes were present in the photographs: eco-centric, techno-centric and, to a lesser extent, anthropocentric. Images produced by pupils are close to the ones produced by professionals, thus suggesting a highly shared figurative nucleus of the representation. Humans as well as components of energy transition different from renewable energy production are once again almost invisible. Overall, these results confirm and extend previous studies and put into question whether Italians are consciously facing the on-going energy transition or not.

Standardising the Cloud – Exploiting An Infrastructure to Shape Another One
Kai Jakobs, Informatik 4, RWTH Aachen University, Germany

NIST identify three areas where adequate standards for clouds are missing – interoperability, portability and security. Especially the public perception of the cloud and its associated security risks suggest that standardisation in this field should take great care to ensure that all stakeholders are involved. This holds particularly for the 'Third Estate' in standards setting, i.e. e.g. small firms, NGOs and the general public.

No single Standards Setting Organisation (SSO) is in charge of cloud standardisation. This, means that members of the Third Estate cannot hope for a new entity that explicitly caters for them. Rather, they will largely have to make do with those SSOs that are around today, and will need to develop strategies to make their voices heard there.

The paper first maps the current standardisation infrastructure. This includes brief discussions of the most important characteristics of the relevant SSOs, including the typical distribution of power in these organisations, the transparency of the respective standardisation processes and the options members of the Third Estate have to influence these processes. Some focus will also be on the links between individual organisations, as these may be exploited by less powerful stakeholders.

Some studies suggest that an experienced and respected representative may well allow his/her employer to punch considerably above its weight. Thus, the paper next briefly discusses some cases in which exactly this happened.

The paper finally draws some conclusions cases that could be used by members of the Third Estate to participate in cloud standardisation more effectively and efficiently.

Doing Design and Experiencing Design. Making and Enduring Technologically Enhanced Environment
Teresa Macchia & Vincenzo D'Andrea, University of Trento, Italy

Increasingly, Information Technologies (ITs) and interactive tools are affecting different domains of our lives, including the informal educational sphere. For example, the introduction of IT and interactive tools enrich museums influencing the design of spaces and providing visitors with different and personalized experiences. Because of this scenario, we seek to discuss on the complexity of formal and informal design of interactive environment in respect to the everyday use and evolution of the exhibition space.

During the second half of the year we experienced the Museum of Science in Trento (MUSE) as ethnographers in the one we defined a Technologically Enhanced Environment. The space we have been observed is almost completely interactive; visitors experience the space through their movements, their voice and their creativity. In this way visitors make sense of technologies through an informal design process that moves steps ahead from the intentional meaning earlier defined by professional designers.

Looking at the exhibition through the design perspective of making enduring changes, we focus on analogies and differences from an expert and non-expert viewpoint. The paper focuses on the implication of design technologies as an ongoing process that takes place with expert designers and that endures through everyday non-expert actions. In this game of everyday changes, the role of experts and non-experts, interweaves in different manners and through different activities.

Is Agile Software Development the Solution to Increase Diversity
Nicola Marsden, Heilbronn University, Germany

Companies and organisations introducing the more and more common methodologies of agile software development are aiming high: they want to be leaner, quicker responding to the needs of users, more open to diverse people – in short be more agile. Agile does not denote a single development methodology, rather a set of ideas with different methods – e.g. Extreme Programming (XP) or Scrum – apply in different subsets and combinations. The organizational principles of agile project organization and management have been hailed as a framework for addressing factors of diversity issues in software development: The empowerment of programmers against managers or the focus on self-organizing teams deciding on their own tasks is seen as a chance for overcoming perpetuating gender stereotypes and power relations, therefore increasing diversity in the field of software engineering.

Yet there are arguments to assume that agile software development can actually be counterproductive to diversity. We will focus on two possible consequences of the agile approach: 1.) social-psychological processes like ingroup phenomena can amplify disparity and lower participation of diverse groups, 2.) the terminology of agile (e.g. „user stories") and the fact that many people, teams and organizations use some of the ideas without embracing a complete method leads to a blurring between programming methods and the design process – this can lead to a lack of interaction with real users with their diverse lifestyles and promote I-methodological approaches. Both would result in the reproduction of existing social dominance and homogeneity.

Children's Perspectives on the World of Work
Christina Pernsteiner, Institute for Education, University of Graz, Austria

Work, paid or unpaid, has a great impact on the human life course. However, depending on the historical, social and cultural context it can take very different forms. In previous research adolescent and adults and their perspectives on work have been in the centre of attention. At first glance it seems reasonable not to ask children what they think and feel about it since above all they are excluded from employment by law since the beginning of the 20th century in many countries. Moreover the main current understanding of childhood is based on conception of a special protection and learning phase in the biography where education comes first, not work[1]. However this approach neglects the fact that children's daily lives are still largely shaped by the way work is organized. This includes especially social and monetary resources and risks and the use of time and space in families. Additionally gender and generational orders[2] are created. Now the barely interest in children's perspectives on these processes is being criticized[3]. This appeal matches with the so called new childhood

Literature:
[1] Bamler, Vera/Werner, Jillian/Wustmann, Cornelia (2010): Lehrbuch Kindheitsforschung: Grundlagen, Zugänge und Methoden. Weinheim und München: Juventa.

[2] Alanen, Leena (2009): Generational Order. In: Qvortrup, Jens/Corsaro, Wiliam A./Honig, Michael-Sebastion (Hrsg.): Palgrave Handbook of Childhood Studies. Basingstroke: Palgrave Macmillan, S. 159-174.

[3] Fuhs, Burkhard/Schneider Susanne (2012): Normalisierungsvorstellungen und Adultismus als Probleme für die erzählerische Erschließung frühkindlicher Lebenswelten. In: Frühe Bildung, Jahrgang 1, Heftnummer 3, S. 125-130.

Porfeli, Erik J./Lee, Bora (2012): Career development during childhood and adolescence. In: New directions for youth development, o. Jg., Heftnummer 134, S. 11-22.

research[4] in which girls and boys are regarded as important subjects with specific knowledge, skills and abilities. In this paper the analysis of semi-structured interviews and drawings of children aged 5 till 10 concerning their understanding of the world of work will be presented. Furthermore general methodological and ethical questions regarding the participation of children in research will be discussed.

http://erziehungs-bildungswissenschaft.uni-graz.at/de/institut/arbeitsbereich-elementarpaedagogik/

Technology Change = Gender Change? Gendered Constructions of Engineering in the Area of Renewable Energies
Bianca Prietl, RWTH Aachen University, Germany

The area of renewable energies is not only expanding as a field of work for engineers it is also discussed as an area that might bring about a gender change in engineering. Such hopes either draw on highly stereotypical associations between women and nature without taking into account the symbolic gender order they are thereby reproducing. Or they refer to first statistics that show higher proportions of women entering engineering programs with a focus on ecology or renewably energies.

Taking these public and political discourses as a background, this paper argues to take a closer look at the *symbolic gender-technology relation* in the area of renewable energies itself. Thus, it is asked what ideas about gender, masculinity and femininity, are prevalent in this domain and how they are co-constructed with ideas about engineering. From a discourse theoretical perspective that understands discursive practices as social practices it is analysed how the engineering activity in the area of renewable energies is described, positioned and thereby gendered. Therefore, the paper empirically draws on qualitative interviews with 'gatekeepers' in this field, that is engineers occupying leading positions in companies operating in the renewable energies industry. Preliminary results will show that 'alternative' approaches to engineering are symbolically feminized and devalued while alignments are sought with traditional understandings of technology and engineering practices. From this it can be followed that there is tendency towards discursively reproducing the traditional symbolic gender order in the area of renewable energies.

---

[4] Andresen, Sabine/Hurrelmann Klaus (2010): Kindheit. Weinheim und Basel: Beltz Verlag.

Bock, Karin (2010): Kinderalltag - Kinderwelten: Rekonstruktive Analysen von Gruppendiskussionen mit Kindern: Rekonstruktive Analysen von Gruppendiskussionen mit Kindern aus Sachsen. Opladen: Barbara Budrich Verlag.

When Relations Become Relationships: Brain-Computer Interfaces
Gabriel T. Velloso, ITAS - Institute for Technology Assessment and Systems Analysis, (KIT - Karlsruhe Institute of Technology), Karlsruhe, Germany

Brain-computer interface (BCI) is a rapidly advancing and emerging research field. Although it has potential to benefit individuals and society, especially through its clinical applications, it also poses questions regarding the development of new dynamics between people and their relations to a technology which transforms their interactions with the world. A BCI could be simply defined as a system which measures and analyzes brain signals, converting them in real-time into outputs that do not depend on the normal output pathways of peripheral nerves and muscles. The acquisition of electrical biosignals from the brain can take place through invasive (from the surface of the brain cortex or inside the brain) or non-invasive methods (mostly through EEG-Electroencephalography). Both ways of acquiring biosignals are close to so called intimate technologies that show an intimate relation, a relationship between the technology and the person, specially with the invasive methods. It is important to pay attention to challenges which arise from this relation/relationship dynamics between bodies and technologies. BCIs can be transformative and could lead to changes in brain structure and function. It has also been questioned whether the long term use of an invasive BCI could lead users to reconsider their bodies, raising problems of self-perception and body ownership. The objective of this presentation is to discuss some points obtained from a survey on perceptions of BCI´s regarding the questions of free will, moral responsibility, privacy, autonomy and some philosophical issues within BCI's when confronting its potential effects on (trans)forming core concepts and values in a deeper relationship between humans and technologies.