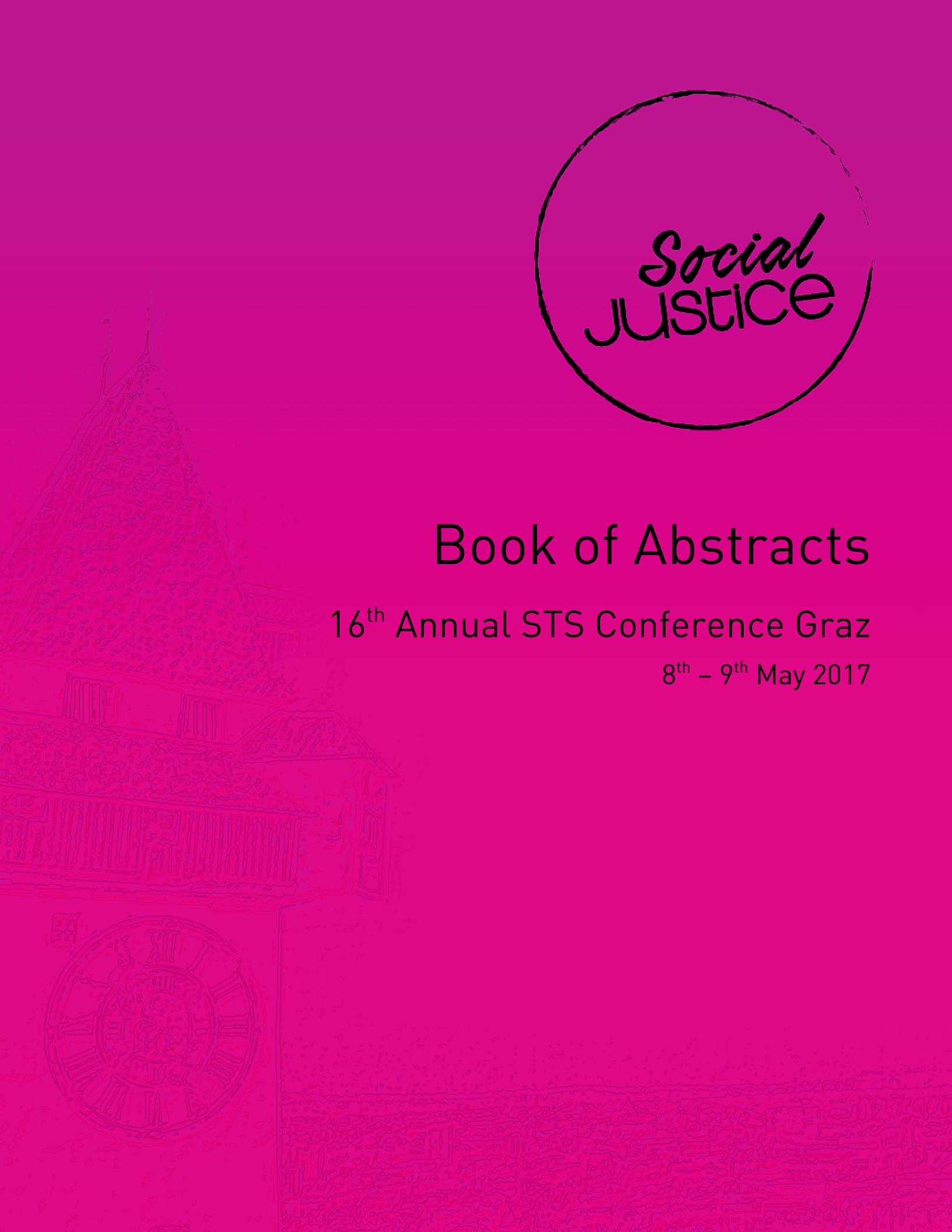

Book of Abstracts

16th Annual STS Conference Graz

8th – 9th May 2017

Keynotes 4

STREAM: Queer-feminist and Gender Justice Issues in STS 6

Session 1(1): Gender equality plans for higher education and science in STEM areas 6
Session 1(2): Gender equality plans for higher education and science in STEM areas 9
Session 2: Motherhood and care-constructions and transformations through technologies 12
Session S3/S6: Queer-feminist engaged pedagogies within STS 14
Session 4: Social gender justice in academia and research 17

STREAM: Sustainable Food Systems 23

Session 7: Social (in)justice and food systems 23

STREAM: The Mobility System and Social Justice 29

Session 8: Demand responsive transport systems (DRTS) – a possibility to enhance social (mobility) justice in rural areas? 29
Session 9: Cycling Cultures 34

STREAM: Towards Low-Carbon Energy Systems 36

Session 10: Sharing local energy and regulatory responses to it 36
Session 11: Energy landscapes as contested terrain 41
Session 12: Social justice in the discourse of the German energy transition 45
Session 19: Social justice and conflicts in transitions to low-carbon energy systems 50

STREAM: Digital STS Discourses 54

Session 13: The webvideo in science communication: issues and trends 54
Session 14: Digitalized industry and social emancipation 57

STREAM: Responsible Research and Innovation (RRI) 63

Session 15: RRI: How to move on from concept to real change? 63
Session 16: How can Responsible Research and Innovation (RRI) support social justice? 66

STREAM: General STS Topics 69

Session 17: Technical standardisation and STS 69
Session 18: New frontiers of surveillance: How just is an algorithm? 73
Session 20: Ethical, legal and social aspects of biotechnologies 76
Session 21: 1000 flowers of STS – General STS discussion 80
Session 22: 1000 flowers of STS – Postersession 83

cancelled Session: Session 5
Layout: Stefanie Egger

Keynotes

Does the internet contribute to social justice?

Joachim ALLGAIER
Alpen-Adria-Universität Klagenfurt|Wien|Graz, Austria

Widely known as a “Father of the Internet,” Vinton Cerf is the co-designer of the TCP/IP protocols and the architecture of the Internet. In a recent interview with the German version of ***Wired*** Magazine Cerf was asked if he was happy with the way how his “child” had developed. Cerf responded that he was very happy with the way how the Internet itself developed. He sees the Internet as a neutral technology, but that he is less happy with how people deal with this platform. Another “Father of the Internet,” Sir Timothy John Berners-Lee, best known as the inventor of the World Wide Web, recently wrote in an open letter that he had imagined the web as an open platform that would allow everyone, everywhere to share information, access opportunities and collaborate across geographic and cultural boundaries. However, he wrote that in the last year he became increasingly worried about three new trends: losing control of personal data online, which has a “chilling” effect on free speech; the rapid dissemination of misinformation and “fake news” via social media sites; and the lack of transparency in political and other campaigns, which in principle opposes the idea of democracy. Other key figures in the development of the Internet also saw a huge potential in the early days of the Internet for the improvement of human living conditions, equality and democracy, whereas today many of them are warning of the threats that various Internet technologies pose to humanity today. I will take the opportunity to use this year’s conference theme ***Social Justice*** to have a look at various publicly discussed developments concerning the Internet and provide some illustrative examples about some complex connections between the Internet and issues of social justice.

Blah Blah Land … Social Gender Justice in Academia and Research

Jennifer DAHMEN (1), Anita THALER (2)
(1) IAS-STS – Institute for Advanced Studies on Science, Technology and Society, Austria (2) IFZ – Inter-University Research Centre for Technology, Work and Culture, Austria

These are the times of rhetoric gender equality. All genders, or at least both, can be and do whatever they want, they are equal. ... are they? Or are some more equal than others?
By combining the concepts of ‚social justice’ and ‚gender justice’ we want to highlight the fact that even by reaching gender equality in academia and research, social inequalities could and will still remain (like precarious jobs, elitist academic recruitment practices, etc.). We understand social gender justice as an intersectional approach and want to discuss, why women*, people

with working class background, people with migrant background, and people on the intersections of these various backgrounds are not well represented in permanent and top positions in academia. Can concepts like Responsible Research and Innovation (RRI) help transforming academia into social gender just work environments, and thus also lead to a higher appreciation and acceptance of alternative careers in science and research?

People's knowledge and the democratisation of science: re-imagining the food system

Tom WAKEFORD
Coventry University, United Kingdom

Moves towards social justice appear to be in reverse. If the STS community is to do more than stand-by and watch the rise of populist movements that undermine participatory forms of democracy it must learn from its failures during the past half century. STS emerged from social movements, but was made largely irrelevant to practical struggles for social justice by making a Faustian pact with the neoliberal model of research. Recent initiatives in the EU and other international institutions reflect a participatory turn among many researchers, but unless researchers urgently adopt approaches based on the principles of participatory action research (PAR), these moves will be too little and too late.

I will reflect on the use of PAR by social movements to build an informed critique of the industrialisation of systems of food production. This has encompassed the eras of mass mechanisation, "green revolution", mad-cow disease, the horse meat scandal and the controversy over genetically modified foods. Crucial to this has been the building of trust through sustained dialogue between researchers with professional training on the one hand and those who have become experts through their life experience on the other. I will suggest that these types of approach have lessons across STS. Stopping the global slide towards authoritarian populism can only be achieved if we are willing to take risks.

The imposition of technologies that undermine democracy and social justice has already played a part in a wide range of violence. Any chance we have of reversing this trend will require a radical shift in how we see our own role. Instead of constructing theories inside our ivory towers we need to turn our energies towards building alliances on an equal footing with the people that live outside them.

STREAM: Queer-feminist and Gender Justice Issues in STS

Session 1(1): Gender equality plans for higher education and science in STEM areas

Chair: ARAÚJO, Emília, University of Minho, Portugal

Gender Equality in ICT Departments on the Example of Simon Kuznets Kharkiv National University of Economics

PLEKHANOVA, Ganna, ZOLOTARYOVA, Iryna

Simon Kuznets Kharkiv National University of Economics, Ukraine

Issues of gender monitoring, analysis and audit become actual for Ukrainian educational institutions. This paper focuses on gender legislation in Ukraine and existing gender equality policies at a university level on the example of Simon Kuznets Kharkiv National University of Economics. As gender inequality is typically a characteristic of computer and technical departments and faculties of universities, the authors have studied current status of gender inequalities at the Economic Informatics Faculty and IT-departments.

In general Simon Kuznets Kharkiv National University of Economics has superficial awareness of gender equality issues. On the one hand, KhNUE is an equal opportunity workplace and equal pay policy is guaranteed for men and women at the University. On the other hand, there are no ethics code or Gender Equality Plan or other documents which are embedded into the organizational culture, and the gender issue is consequently not part of any decision making process. In order to achieve gender parity, according to the authors, the University should apply following instruments: - to establish the post of Gender Equality Officer at the University; - to raise awareness of staff and students about the importance of gender equality; - to integrate the gender perspective at all levels and in all procedures of the Universi-ty, including any decision making process; - to prepare a Gender Equality Plan in cooperation with staff and student representa-tives. Special attention shall be paid to the attainment of gender equality in student selections and when organising teaching and evaluating study performance, and to measures to ensure the prevention and elimination of sexual harassment and gender-based harassment.

Keywords: gender equality, gender legislation, economic informatics faculty, ICT Department

Roles of early career researchers in European collaborations in nano S&T

ULNICANE, Inga
University of Vienna, Austria

What role do early career researchers – PhD candidates and Post Docs - play in European research networks in an emerging field of nanosciences and technologies? Are they just carrying out experiments designed by senior scientists? How much influence do PhD researchers and Post Docs have on collaborative research activities, choice of partners and co-authored publications? These questions are of great relevance for understanding contributions and treatment of early career researchers in a research field that strongly depends on laboratory work performed by them. Additionally, this topic is important in context of recent science policy studies on changing scientific careers and fairness in allocating credit for co-authored publications. Thus, this paper addresses the key conference topic of social justice by analysing diverse roles of early career researchers in European collaborations in nano S&T.

To address these questions, the paper draws on extensive empirical research on European research collaborations in nano S&T including 61 semi-structured interviews with senior and junior scientists, site visits to 31 research institutes as well as project, publication, organizational and CV data. Seven longitudinal case studies were undertaken of research collaborations lasting over 10 and 25 years. Collaborations among leading institutes in nano S&T in Germany, the Netherlands, France, Belgium and UK were studied. While some European collaborations studied took place informally, others were funded by the EU Framework Program projects which provide funding for PhD and Post Doc positions and support their research training and exchange visits.

Within a broader study of European collaborations in nano S&T, the role of early career researchers emerged as one of interesting topics. In contrast to stereotype that such collaborations are dominated by senior scientists, empirical data demonstrate that early career researchers often play an important role in these collaborations. Some of these networks were launched by PhD candidates and Post Docs. Early career researchers played an active role in designing collaborative experiments, doing them jointly while visiting each other and writing co-authored papers. While overall trend confirmed by senior researchers with long-term experience of such networks is towards increasing role of early career researchers, considerable differences in their status across countries, institutes and collaborations persist. Early career researchers doing their PhDs and Post Docs within European collaborations experience not only benefits of additional support, network and motivation but also challenges of project pressures, hierarchy and sometimes limited engagement of senior scientists. Successful and productive research collaborations typically are characterized by active role and empowerment of early career researchers who in a long-term can contribute to further growth of collaboration and respective research field.

Keywords: early career researchers, European scientific collaboration, science policy, scientific careers, nano S&T

Gender Inequality: promoting reflexivity and cultural change

ARAÙJO, Emilia
University of Minho, Portugal

This presentation seeks to diagnosis and discuss the main difficulties in promoting gender inequality at universities and research centres with a view to present a set of good practices which can help people to deal with those kinds of inequalities within that contexts, as well as to guide policy makers to enhance policies and measures that can actively ameliorate women's and man's lives at these institutions. For this to happen, it is our view that a time politics, as well as a diversity politics are needed and they should be integrant parts of a broader equality evolving culture. In fact, recent years were highly prolific in studies addressing gender inequalities across diverse organizations and fields of work. What rests intriguing if the manner in which these results and its recommendations are hardly incorporated in institutional actors' practices. Being part of a broader invisibility and forgetfulness of other scientific results which touch deeply matters of class and status inequality, the lack of reflexivity about the results being produced concerning gender issues within academy and science, allied to a strong ideology deep routed on capitalist and linear managerial principles, has been leading to a strong disregard of gender studies and gender themes, with impact over the importance of social sciences, in general, and the accurate valorization of women scientists and academics. This communication debates some of the main scientific results obtained through studies made within the academic and scientific settings and, together with an analysis about the good practices being presented for European context, analyses the processes and the conditions under which gender can be object of reflexivity and participative debate in academic institutions. For this purpose, authors will present and discuss the results of a research made in Portugal concerning the uses and representations of time of academics, including professors in policy making positions inside research and academic institutions in Portugal.
Keywords: gender, inequality, gender policy, culture for diversity

Sustainable implementation of gender action plans

SIEBENHANDL, Karin
Donau-Universität Krems, Austria

I hope that "we move beyond rhetoric! The outcome would be a nicer place to work. People feel that they are rewarded on the basis of their performance and their contribution" answered one participant when asked about the expectations raised by the GenderTime project. [1]
Gender equality is an important topic for science organizations – not only, but especially in technical disciplines. To achieve lasting equality, science needs a culture that is sensitive to gender and diversity in all its endeavours: individual and social, structural, institutional and political [2]. Consequently, attention is shifting from gender sensitization towards encouraging structural changes in research organizations, which means also a change of organizational processes. But often, to take new actions, the management needs occasions, which act as

“motor” and put new procedures into operation. The GenderTime project seeks to contribute to an organizational and structural change towards gender equality – a lasting transformation of institutional practices through the implementation of gender action plans. Within this paper we present the analysis of the evaluation on the impact after the implementation phase at seven European Organizations. We discuss the evaluation process that accompanied the course of the project and highlight strategies as part of the implementation of gender equality measures. We introduce exemplary measures which are already implemented in the institutions and discuss how they can address known obstacles towards gender equality in science especially in terms of the sustainability. [1]Research project funded by the European Commission in the 7th Framework Programme: “Science in Society”, Start 2013; Duration 4 Years. http://www.gendertime.org [2]Mühlenbruch, B. & Jochimson, M.A. 2013. Only wholesale reform will bring equality. Nature, 495, 40-42.

Keywords: women in science, evaluation, gender equality, structural change

Session 1(2): Gender equality plans for higher education and science in STEM areas

Chair: BARROS, Victor, University of Minho, Portugal

Decoding femininity in computing in India

VARMA, Roli

University of New Mexico, United States of America

Scholarly literature on the construction of gender in computing in the West has focused on the differences between men’s and women’s representations in the computer science (CS) and computer engineering (CE) fields and their perceptions of computer technology. Men are seen as mostly interested in the computer technology especially on programming; in contrast, women are seen as mostly interested in the social aspects of computer technology especially its use for the society. The dominant trend in the scholarly literature is that the CS/CE themselves are gendered. I question such view of gender and computing fields by using example of women in India. Contrary to the situation in the West, there has been a significant increase in the number of women entering CS/CE fields. This is despite the prevalence of Indian patriarchy—a system of male dominance legitimized within the family and society through superior rights, privileges, authority, and power granted to men. Based on 60 in-depth interviews conducted with women enrolled in CS/CE fields at four institutions of higher education in India, I propose the cultural construction of gender and computing fields. Unlike in the West, CS/CE are viewed as women-friendly fields in India.

Keywords: geek, math self-efficacy, gender & computing

One does not simply investigate a gender gap: gender & the evolving field of data journalism

GOLDGRUBER, Eva
FH JOANNEUM - University of Applied Sciences, Graz, Austria

The increasing quantity and availability of data is a crucial factor for journalists and enables new ways of news reporting by making use of data science elements and technology in their work routines. Hence, these communication professionals do not typically have a STEM background and therefore are facing gaps concerning usage, technology or workflow as so called casual users. VALID (Visual Analytics in Data-driven Journalism) is an ongoing Austrian research project that investigates the field of data-driven journalism (ddj). It studies data-journalistic routines and creates tools that will help journalists to work better with heterogenous data sources. However, investigating gender relations, uncovering women, or doing research on (female) data journalists and their heterogeneous technological skill set and experiences as a part of this project is a complex endeavour, because the vocational field is yet emerging, particularly in Europe.

The aim of this presentation is to discuss the manifold gender dimensions and their complexity when investigating gender in the field of data-driven-journalism and emerging data journalistic practices, which are closely linked to technology.

Insights from a systematic literature review on data journalism research[1], reveal that gender issues are under-researched, although mainly problematized regarding the (male-dominated) field of technology. However (the lack of) interest and education as well as the experience of women (working in the communication field) with technology tools and data journalism methods were refereed to in the analysed corpus.

On the basis of the aspects extracted, this works tries to understand how multiple volatile conceptions, including gender, technology and journalism, interact and construct data journalism (and vice versa) and may draw up barriers to women's employment in this new professional field. Especially the impact on women's and men's careers are a crucial issue. This work adopts and combines approaches associated with feminist and journalism schol- arship that address technology. Gender diversity in data journalism is assessed in the framework of of co-construction (Judy Wajcman, 1991), co-materialisation (Gabriele Winker, 2005) - in the tradition of Judith Butler (1993), data and tools as entities (Donna Haraway, 1991) or as actants (Bruno Latour, 1996) and his Actor-Network Theory (ANT), which is also widely perceived in ddj. As a result it advances the understanding of gender dimensions in the investigation of data journalism, and the importance of gender equality and gender diversity in the professional field. The results also point out the importance of gender awareness in (data) journalism education to reduce prejudice and gaps.

[1] Ausserhofer, J., Gutounig, R., Oppermann, M., Matiasek, S., & Goldgruber, E. (in press). The datafication of data journalism scholarship: Focal points, methods and research propositions for the investigation of data-intensive newswork. Journalism.

Keywords: gender, data journalism, technology, digital competence, journalism education

Implementing gender equality: finding inroads into Czech chemistry

NYKLOVA, Blanka
Institute of Sociology, Czech Academy of Sciences, Czech Republic

As the 2015 report on the position of women in Czech science reads, although the total number of people employed in research keeps rising, in 2014, “the proportion of women among people employed in research was the lowest since 2001. Women accounted for 30.9%, which is 5.7 percentage points less than in 2001” (Tenglerová, 2015). The figures fail to reflect the fact that the number of women among university MA and PhD students of natural sciences has grown in the CR and reaches over 40% in both levels. In other words, the problem is clearly not a lack of interest in STEM disciplines on the part of women students, which is something often assumed in the local context (Jarkovská, Lišková, & Šmídová, 2010). The Gender and Science team has long been a leading department in STS research using a gender perspective in the Czech academic environment. Among other things, it has focused on analysing conditions especially within public science through a lens of gender concerning both the content of knowledge produced and the gendered nature of scientific institutions and policies (Linková & Červinková, 2011; Linková & Stöckelová, 2012; Vohlídalová & Červinková, 2012). Besides research, Gender and Science also provides counselling and assistance with project applications in the area of implementing cultural and institutional change in order to create gender equality within academic institutions. The paper aims at exploring the ways in which it might be possible to find inroads leading to actual changes at a STEM institution resistant to any attempts at implementing procedures leading to increasing organisational gender equality in the above-described gender conservative context. The research for the paper is based on an EU framework project – TRIGGER – that aims at implementing gender equality at the University of Chemistry and Technology (UCT) based in Prague. Gender and Science is a partner of UCT guaranteeing gender expertise necessary for the project. The team members have tried implementing multiple measures, but even conducting an anonymised survey has proven challenging. Therefore, it came as a surprise when a book of interviews with women scientists from the institution became a major success and led to the request from UCT for a similar book with men scientists. In the paper, I focus on an analysis of how the Gender and Research TRIGGER team members have negotiated in order to turn the book into a meaningful project. At the same time, I present the preliminary results of a comparative analysis of the interviews with men and women researchers focusing on both the barriers indicated in the interviews and on the inroads that such interviews and their presentation offer in gender conservative environments highly resistant to change, such as those of East European countries.

Keywords: gender equality policy, implementation, resistances

Session 2: Motherhood and care-constructions and transformations through technologies

Chairs: SABOROWSKI, Maxine, COMPAGNA, Diego,

TU Berlin, Germany

Constructions of motherhood in the legislation on genetic paternity testing. Reflections in the context of family policy

SABOROWSKI, Maxine

TU Berlin, Germany

In the German legislation on access to genetic paternity testing, a new construction of motherhood becomes visible. The mother is constructed as the subject who has the privilege to know the natural father of the child, it is a position of knowledge. The change of motherhood will be analysed with regard to family policy. In times of "activating welfare states", support for children of single mothers is only provided when a mother is willing to disclose the name of the father, therefore to become active in claiming financial support from the child's father. One further question is whether the duty of the mother to disclose the father's name is seen as a necessary duty that is part of the care that a mother owes her child.

The contribution looks at the German legislation in the 21st century and how motherhood is constructed in these regulations. The constructions of motherhood will be analysed in the context of recent transformations of the welfare state.

Keywords: motherhood, construction, genetic paternity testing, welfare state, legislation

Social robots for homework and childcare – first results of focus group interviews

COMPAGNA, Diego

TU Berlin, Germany

The development of social robots reflects engineers' understanding of social arenas as well as the social actors primarily responsible for structuring and shaping these arenas. The design of social robots is contingent upon the role model of the persons performing the task the robot is supposed to take over or help with through cooperation. Over the past two years we conducted a primarily autoethnographic empirical study as active members of an interdisciplinary research group dedicated to the study of human-robot interaction. Within the setting of a fabrication laboratory (FabLab), the central research topic is to bring to light the most relevant factors to ensure a smooth and user-friendly experience of human-robot interaction in areas primarily addressed by the relatively new field of social robotics. The engineers (hardware and software) tend to orient their work along the lines of assumed societal needs and expectations of the "target groups" that should take benefit from the artifacts. With respect to the development of

social robots for homework and childcare, the reproduction of gender stereotypes, especially regarding the role of motherhood – assigned to the women – is very evident.
To enrich these essentially autoethnographic observations, we decided to conduct focus groups (aka in-depth) interviews with at least four distinct probable target groups (theoretical sampling) with an average of approximately eight persons in each group. The overall concept of the focus group's design was a future scenario assessment evaluating the use of social
robots dedicated to both homework and childcare over a time span of five to 50 years. The first analysis of the recorded and transcribed data shows a clear distinction between childcare and homework, with an emphasis on the link between women's roles (clearly linked to motherhood) and childcare as a natural and therefore 'deterministic' attribution (which is indisputable) on the one hand, and a very negotiable area of activities dedicated to homework on the other hand. In this regard, social robots employed for childcare and homework should be designed in very different ways. Social robots for childcare should either not exist at all, or be very 'feminine' and stereotypically 'woman-like'. However, despite these tangible findings, a very general result is the extremely stable – and indisputable – link between childcare, motherhood, and nature and the pervasive viable breakdown of most of the discussed statements as rooted in this 'premised' axis of reference.
Keywords: social robots, homework, childcare, motherhood, nature

Mothers before pregnancy? The expansion of motherhood and motherliness by genetic carrier screening and preconception care

WEHLING, Peter, KOSTAN, Anastassija, DREANO, Clément
Goethe University, Germany

The paper focuses on a seemingly paradoxical tendency to expand the normative expectation that women act and feel like (future) mothers to the period before conception, thereby constructing „pre-pregnancy" as a new stage in women's life. The two most important driving forces of this are health and educational campaigns based on the notion of „preconception care" on the one hand, expanded genetic carrier screening on the other hand. Preconception care campaigns are urging women to show their motherly love and optimize their health even prior to pregnancy for the sake of future children. Such campaigns are „advocating for women to view themselves as potentially pregnant, in an attempt to shift the meaning of contemporary motherhood and womanhood to encompass the embodiment of a prematernal state" (Waggoner 2015: 941). Such attempts are reinforced by „expanded carrier screening" (ECS), a novel genetic technology, which to date is available only as commercial „direct-to- consumer" (DTC) offering on the Internet. ECS aims at informing couples of reproductive age whether or not both of them carry the genetic mutations for the same recessively inheritable disorder. If so, each child would have a 25-percent chance of actually inheriting the mutation from both parents and being affected by the disorder. Since most people are assumed to be carriers of at least one recessively inherited genetic disorder, the whole population becomes the target group of ECS. While carrier screening of course can be done during pregnancy, medical researchers as well as ethicists strongly recommend to undergo it before conception, that is in „pre-pregnancy". It is

argued that, in case of a positive result, a couple would have more „reproductive options“ prior to conception than during pregnancy in order to prevent the birth of an affected child.
Apart from all other political, ethical and social implications, this technology is likely to contribute to a reconfiguration of gender relations in reproductive settings and, in particular, to both a temporal extension of motherhood and its reframing mainly in terms of emotional love, but also careful planning. Unsurprisingly, in commercial advertising women are addressed as the primary users of ECS. In order to motivate them to undergo carrier screening (preferably before conception), „motherly“ feelings of love and care even prior to pregnancy are evoked. In addition, it is common practice that women are screened first, and only if a genetic mutation is found, will their male partners be tested as well. Consequently, women not only have to carry the main burden of potentially frightening genetic knowledge, but are also held to be responsible for motivating their partners to undergo carrier testing. Carrier screening and preconception care campaigns have (at least) two important wider implications: First, since all women of reproductive age are, in a way, always „pre-pregnant“, they are expected to always behave like (potential) mothers. Second, the fact that motherhood is framed primarily as a state of emotional love and self-forgetting care is likely to have serious impact on gender roles in parenting and child education.
Keywords: carrier screening, preconception care, motherhood, reproduction, gender roles

Session S3/S6: Queer-feminist engaged pedagogies within STS

Chairs: FOSTER, Ellen, Rensselaer Polytechnic Institute and Institute for Advanced Studies in Science and Technology Studies, United States, AG Queer STS, Austria

EW2MS: The possibilities for culturally situated design tools and experiential learning in STEM

FOSTER, Ellen
Rensselaer Polytechnic Institute and Institute for Advanced Studies in Science and Technology Studies, United States

This presentation will explore the educational possibilities of experiential learning through culturally responsive and culturally situated design. Specifically, it looks at the possibilities of maker cultures and programs to enact a more critically-engaged and social justice-oriented pedagogical practice. This will be done by examining a collaborative educational case study which the presenter has helped to develop called E-Waste to Makerspace (EW2MS). A critical analysis of the program will use Donna Haraway's concept of 'situated knowledges,' John Dewey's critique of School and Society, as well as bell hook's engaged pedagogy. I hope to reveal both its constraints and capacities for engaging students in STEM programming in a way that is relevant to their lives and situations and helps them to develop a critical stance. This

example will then be the jumping off point from which to examine other similar programming such as CompuGirls, Black Girls CODE, Maker Jawn, and Techne, as well as less critically engaged STEM through 'making' programs.

Keywords: experiential learning, engaged pedagogies, situated knowledges, situated learning

Teaching gender and social justice in the STEM fields: Experiences within one interdisciplinary classroom setting

TREUSCH, Pat

Center for Interdisciplinary Women's and Gender Studies, TU Berlin, Germany

"How to teach Gender and Social Justice in the STEM fields?" is the main question this presentation will address. In doing so, it will revisit experiences made in one interdisciplinary classroom setting, namely the so-called project-laboratory "WiSiGen: Wie versteckt sich Gender in MINT?" (How does Gender hide in the STEM fields?) that is part of the orientation studies program "MINTgrün" (STEMgreen) at Technical University Berlin. The pedagogical outline of this project-laboratory is oriented at the concept of research-based teaching as it is mainly established within the STEM fields. Thus, at the focus is to teach a selection of basics of Gender Studies in STEM to then foster the application of this knowledge. More precisely, the course is divided into two different phases: a first one of getting familiar with humanistic inquiry at large as well as selected feminist theories and qualitative research methodologies in particular that is followed by a second phase of applying this knowledge through pursuing a small research assignment. However, and importantly, it is a fundamental part of the concept of research-based learning that the topic of research is chosen by the groups – instead of being assigned by the teacher.

The format of this course carries different challenges with it that I experience as especially demanding in stipulating the complex knowledge transfer while focusing on group-chosen projects that rely on applying what might not be learned, yet. I furthermore divide this complex knowledge transfer into three steps: 1.) the step of unlearning common sense knowledge about Gender and Social Justice; 2.) the succeeding one of grasping with the interrelations between knowledge and artefact production (the main field of their study interests) and questions of Gender asymmetries and societal injustices; and finally, and 3.) the step of becoming able to formulate a research interest and conduct a project in accordance with the theoretical-methodological framework of this course. One strategy of mastering those challenges has proven extraordinarily productive: to acknowledge the reciprocity of teaching-learning-relations.

By sharing experiences in mastering those and additional challenges, I aim at exchanging strategies of a feminist "engaged pedagogy" (bell hooks 1994) and thus also at discussing the question of how this classroom setting might be constitutive of possibilities to learn Gender and Social Justice as part of the STEM education, that is, discussing its possibly transgressive potential.

Keywords: gender in STEM, teaching as learning, feminist pedagogies, interdisciplinarity

The queer-feminist code – utopia or real opportunity for change?

THALER, Anita, WICHER, Magdalena
IFZ – Inter-University Research Center for Technology, Work and Culture, Graz, Austria

What if coding was a way to solve your problems? What if coding was so simple; you would understand how to do it intuitively? What if computer codes were not binary, but rather fluid like life itself? What if . . . ?

We began to think about a queer-feminist understanding of coding, when we evaluated a coding-initiative for children with an ethnographic approach. When we later wrote a book chapter about the democratisation and system-critical potential of code-camps and how a queer-feminist approach could help improving this potential we were hooked. Most coding initiatives are aiming on education in terms of employability to make young people ready for the labour market in a globalised world. Educating children and young people in coding

– and digital competences in general (as defined as one of eight key competences by the European Commission) – is thus exploited within and for existing capitalistic, patriarchal systems. Our queer-feminist code for teaching digital competence is based on these ideas: First, educating children and young people in coding should aim at making them competent in solving their everyday problems in terms of building fundamental competences in an emancipatory educational tradition (Oskar Negt 1998). Second, coding should be accessible for everybody, thus also 'educationally disadvantaged' young people should be in clear focus. Third, coding itself should be thought radically different, to open up new ways of thinking and open up new opportunities.

We will bring our research, ideas and hands-on material (from the kids' code camp) and invite all people interested in the topic to create a queer feminist utopia of coding with us.

Keywords: queer-feminist, queer-feminist technology, coding

Hands on hacking: From feminist jurisprudence to classroom practice

SIVAKUMAR, Niranjan
KCL – Kings College London, United Kingdom, Sciences Po médialab, France

This paper builds on an "intellectual style" drawn from the feminist jurisprudence of Karen Knop, Annelise Riles and Ralf Michaels (2012). This style is based on principles drawn from private international law, also known as "conflicts of laws", and is rooted in contextual inquiry and the employment of "as if" questioning drawing on a tradition of legal fictions to invert hegemonic, top-down approaches to law and policy. Such an approach is particularly well suited for questions of data privacy and security as conceptualized through a frameworks of "contextual integrity" (Nissenbaum, 2006).

An analogous approach to problem solving based on creativity, flexibility, humor and transgressive politics is seen in the "hacker ethic" as described by anthropologist Biella Coleman (2016). Hackers use tools and techniques to deconstruct and reconfigure, using decompilers and exploits on technological artifacts in the same way that Knop, Riles and

Michaels ask policy makes and lawyers to use dépeçage to re-configure legal questions in the pursuit of justice.
In an attempt to more closely draw together the hacker ethic with feminist jurisprudence, this project goes beyond using hackers and hacking as mere metaphors and instead engages with their material practices in a pedagogical experiment to develop alternative mindsets and approaches to non-technological issues of policy and law. Students are introduced to tools used to break and bend digital technology and encouraged to play and experiment to understand in a hands-on fashion both the fun and frustration of hacker practices while simultaneously learning to approach issues from alternate viewpoints. Participation in these activities also serves to de-mythologize the figure of the hacker and to treat digital technologies as a situated, material technology instead of an idealized, abstract and distant phenomena. This presentation discusses examples from real-world teaching to present the ways in which this form of engagement succeeded (or didn't.)
Keywords: feminist jurisprudence, hackers, privacy, security

Session 4: Social gender justice in academia and research

Chairs: DAHMEN, Jennifer, Universität Wuppertal, Germany,
THALER, Anita, IFZ - Inter-University Research Centre for Technology, Work and Culture, Austria

The (re)production of heteronormativity in the discourse of gender equality and justice in engineering

GREUSING, Inka
ZIFG – Zentrum für Interdisziplinäre Frauen- und Geschlechterforschung, TU Berlin, Germany

In Germany today, engineering is still a men's domain. This is in contrast to the public discourse, which seems to assume gender/sex equality and justice as achieved and also to the long lasting efforts to raise the quota of women in this field. The sociologist Angelika Wetterer coined the expression of "rhetorical modernisation" for these contrasting phenomena. In my research on gender and engineering I'm interested in what engineers think about these contradictions. Is this even taken as such? Through narrations in interviews and field contact with engineers, interpretative patterns became transparent as effective agents in this field. In my talk, I want to show how field-habitus, the knowledge of gender/sex and heteronormativity are intertwined in the social field of engineering. Further I will show how the heterosexual matrix (Judith Butler) spreads its power in such a way that effective (hegemonic) interpretative patterns of gender equality and justice in the field (re)produce inherent heteronormative power structures and the hegemony of masculine dominion.
Keywords: heteronormativity, heterosexual matrix, gender, gender knowledge, social field of engineering

Risks and motherhood-related uncertainties during PhD studies in engineering

PAKSI, Veronika (1), Gábor KIRÁLY (2), Beáta NAGY (3)

(1) Institute for Sociology, Centre for Social Sciences, Hungarian Academy of Sciences, Hungary, (2) Budapest Business School and Corvinus University of Budapest, Hungary

(3) Corvinus University of Budapest, Hungary

The horizontal and vertical segregation of women in technical fields is well documented. Reasons for their low representation is multifaceted, including how the stereotypes reinforce the essentialist constructions of science and gender, how early socialisation plays a role in women's career orientation and how the different structural barriers in STEM cultures alienate women from science. The early-stage research career is a special life period when young women often study, work and raise children at the same time, therefore, they possibly face the majority of the obstacles to women's career advancement. Young women already are disposed to a greater labour market uncertainty and risk concern- ing employment and working conditions, let alone the cumulative and negative effects of childbearing on their career. Women's labour market opportunities and work-life balance are further hindered by the highly male-dominated organisational cultures in knowledge-intensive professions. Moreover, some characteristics of studying and working in STEM fields, such as the laboratory work, could permeate the opportunities and decisions of these young women in relation to childbearing.

Research into the issue of 'women in science' often carried out by using different metaphors, such as the leaky pipeline or the labyrinth, but scarcely applies grounded theory. In our research we aimed to explore the different uncertainties and risks young chemical and electrical engineers face when planning and/or becoming mothers. For the theoretical framework we use Blossfeld's model of uncertainty and Beck's risk theory. Results of 25 semi-structured individual interviews with female PhD students in Hungary show that young engineers face serious obstacles to harmonising their motherhood and career. The uncertain labour market opportunities and the male-dominated organisational culture heavily affect their childbearing-related decisions especially in the private sector. Moreover, working in laboratories with hazardous substances further narrows their childbearing plans.

Our research using both risk and uncertainty theories gives a more complex understanding of women's constrained career in a highly male dominated technical field in a post-socialist context. It reveals how the cross-effects of different uncertainties and health risk play a role in childbearing-related decision-making of young female engineers. It is a policy implication that young female researchers need social support to overcome the obstacles in order to have long-term career prospect in science.

Keywords: uncertainty, risk, motherhood, engineering, PhD

Excellence perceptions of scientists in science and technology and gender equality in appointment procedures

WOLFFRAM, Andrea,(1) HENZE, Jennifer (2)
(1) RWTH Aachen University, Germany (2) Leibniz University of Hannover, Germany

The presentation focuses on the subjectivity of “excellence evaluations” in promotion and hiring processes in Science and Technology at academia. On the basis of a case study that was carried out at a German University of Technology which gained the label “Excellence University” within the German Excellence Initiative, the perceptions of female and male professors, postdocs and PhD students were analysed. In qualitative problem-centred interviews the scientists were asked about their ideas of an excellent researcher, how excellence is acknowledged in appointment procedures and how they assess the meaning of gender equality in this context. Accordingly, one key issue of the analysis was how the demands of gender equality and the concept of excellence are negotiated in appointment procedures from the viewpoint of researchers. Further results refer to experiences of the respondents about formal and informal issues to get evaluated as an “excellent researcher” and to become successful in appointment procedures. The occurrence of gender bias in the evaluation processes and the requirement of gender equality measures in appointment procedures were seen contradictory among the respondents and do not differ unambiguous between male and female researchers. The case study was part of the European project FESTA -Female Empowerment in Science and Technology Academia, which aimed overall to enhance social gender justice in academia and research.
Keywords: social construction of excellence, science and technology, career paths, promotion, recruitment and selection, women in academia

Dependencies of independence – what really matters about the construction of excellence in grant selection processes

HAAS, Marita
Vienna Technical University, Austria

This paper deals with the construction of gender asymmetries in scientific and technological careers in relation to the now more often required excellence-criterion of independence. In academia, the terminus excellence is based on publication record, citation indices, and membership in scientific boards, and reflects the value or the evaluation of the scientific competence of a person. However, it has been critizised for neglecting the power of gate keeping and networking (cf. Husu 2001, Van den Brinck and Benschop 2012; Van den Besselaar & Sandström 2015) and its correlation with the male and (hetero-)normative picture of the “ideal scientist” (cf. Acker 1990; Bailyn 2003; Faulkner 2007,2008; Knights and Richards

2003). Independence has recently become as a central dimension in order to evaluate the scientific potential of a person; the inherent question behind whether a person is able to drive his or her career and become one of the top researchers.

In our empirical paper we pose the question of how decision makers construct and practice independence in the evaluation process of a high potential's grant. As far as the salient gender segregation and discrimination in academia is concerned, we are especially interested in the gendered construction of independence. Addressing the research question, we use 32 qualitative interviews with decision makers of a European Research Funding Organization (RFO) (Schiffbänker & Holzinger 2016). We investigate how independence is constructed in the specific promotion and grant selection process for young researchers and whether this is done differently for female and male scientists. With a grounded theory approach (Glaser & Strauss, 1987) we extract notions of independence the interviewees have in their mind. While recent research has identified social independence, topical independence and geograph- ical independence as the main elements of the construction and evaluation of independence (Van den Besselaar and Sandström, 2015), we see that, in the evaluation practice, three layers are in place:

(1) First, we state that independence is a multi-dimensional construct that connects to the construction of how to establish new ideas and new ways in science and thus relates to the development of the own creativity and innovativeness. In this context it is dependent on how scientific activities are organized on a team level and in interaction with the supervisor in place and how much autonomy is given to the junior researcher. In this context, there seems to be an inherent call to not cooperate with a former supervisor (any more). Thus, the question how to become independent depends as well on the supervisor's construction of independence and excellence and whether he or she allows the junior to become more and more independent over time. (2) On a second layer we therefore construct independence as a means of distancing and emancipating from a former supervisor, showing the own social and topical mobility and the skill to establish and take over responsibility for own research ideas and streams and the own research network. Independence in this context is dependent on the negotiation power of the junior scientist. (3) Based on the interviews with decision makers of the RFO evaluation panel we were thirdly able to understand how independence is constructed and practiced in the grant selection process: Importantly, when being confronted with ambivalences and contradictions how to identify the notions of independence – above all the evaluation of individual contribution vs. output of the whole team; or influence of the supervisor when it comes to a publication – decision makers fall back on their individual experiences. The experiences of decision makers, however, are subject to the gendered structures and processes of science organizations. Individual constructions of the ideal scientist (cf. Acker 1990) or how science has do be done in order to be excellent (cf. Van den Brinck & Benschop 2012, 2014), reproduces and further perpetuates the gender bias that is inherently inscribed in promotion processes in academia.

In our presentation we will discuss and further develop these empirical findings and derive implications for theory and (evaluation) practice with respect to the question how different constructions of independence could lead to a more social gender justice.

Keywords: independence, excellence, scientific system, gendered processes, social gender justice

How (un)equal is our academia? About social (in)justice and gender (in)equality at Austrian universities

KINK, Susanne
AG Queer STS, Graz, Austria

At Austrian universities, numerous measures and initiatives exist, which aim at increasing the social mobility (keyword: study grant, first generation students etc.) and increasing the proportion of women in science (keyword: quotas, UG2002, FEMtech etc.). Nonetheless, even today the question of how equal (or vice versa, how unequal) our academia is arises. Despite decades of efforts for social justice and equality of men and women, science even today remains a male and privileged (especially in terms of class privilege) domain. Although stereotypical discrimination by now is barely explicitly expressed, masculinity and privilege implicitly are still mechanisms that complicate (or even deny) certain individuals' path in science. By means of an interview study in the natural sciences (chemistry and geology), the paper contributes to uncover these implicit mechanisms and therefore highlights possible obstacles on the way to the top of academia, especially in natural sciences.
Keywords: in(equality), implicit mechanisms, qualitative interviews, natural sciences

The role of excellence in a reflexive approach to gender equality

WROBLEWSKI, Angela
IHS - Institute for Advanced Studies, Vienna, Austria

Gender equality in science and research has a long tradition and is based on a comprehensive policy mix (Wroblewski et al. 2007). The policy mix implemented as well as the current state of equality differs between sectors (university sector, universities of applied sciences, non-university research sector). However, in all sectors we recognise the phenomenon that despite a comprehensive policy mix implemented only moderate change occurs. Although female representation increased in all sectors, segregation in male dominated and female dominated fields of study persists as well as an underrepresentation of women in top positions. Thus we may talk about a gender equality paradox in science and research in Austria. The paper focuses on this paradox and discusses its possible reasons. In a first step the gender equality mix to support gender equality for the university and the non-university sector described. Based on this description available information on the implementation of relevant gender equality polices is presented. A more in-depth look at implementation reveals that gender equality goals are formulated by higher education policy or university management as organisational goals. Often they are implemented in a formalised way and are perceived by stakeholders as bureaucratic requirements. Neither the formulation of goals nor their implementation touches disciplines or the perception excellence. Only in exceptional cases the implementation of gender equality polices is linked to a reflection of practices and processes from a gender perspective. In these cases

the implementation of gender equality policies is conjoined with a reflection of traditional practices and the development of alternative practices when a gender bias is detected. Such a reflexive approach to gender equality inevitably questions the notion of excellence and perceptions of a "good scienctist". In the paper I will give examples of such a reflexive approach and will conclude with preconditions for the development of a reflexive gender equality policy. References Wroblewski, Angela (2015), Individual and institutional reflexivity – a mutual basis for reducing gender bias in unquestioned practices, International Journal of Work Innovation, 1(2): 208-225. Wroblewski, Angela; Gindl, Michaela; Leitner, Andrea; Pellert, Ada; Woitech, Birgit (2007), Wirkungsanalyse frauenfördernder Maßnahmen im bm:bwk. Materialien zur Förderung von Frauen in der Wissenschaft, 21, Wien: Verlag Österreich.
Keywords: gender equality policy, reflexivity, excellence, practices

Panel Discussion: How to overcome social gender injustice in academia and research?

RICHMOND, Karen, University of Strathclyde Glasgow, United Kingdom
SIEBENHANDL, Karin, Donau Universität Krems, Austria
VARMA, Roli, University of New Mexico, United States of America
WROBLEWSKI, Angela, IHS – Institute for Advanced Studies Vienna, Austria
ARAÚJO, Emília, University of Minho, Portugal

By combining the concepts of ‚social justice' and ‚gender justice' the fact has been highlighted that even by reaching gender equality in research organisations, social inequalities could and will still remain (like precarious jobs, elitist academic recruitment practices, etc.; Dahmen & Thaler 2017). Social gender justice can be seen as an intersectional approach and in this panel, we want to discuss with international experts:

- How can more persons with diverse background reach permanent and top positions in academia?
- How can we overcome the 'two-class-system' in research (few permanent /tenured positions with financial security and good career opportunities vs. third-party-funded researchers with limited contracts)?
- How can we overcome the 'two-class-system' in teaching (external – „freeway flyer" – lecturers who teach at multiple universities with part-time contracts vs. tenure track position lecturers)?
- How can research funding policies and evaluation systems become more social gender just and inclusive (e.g. by including social impact)?
- How can a different approach of 'excellence' lead to a more social gender just research?

STREAM: Sustainable Food Systems

Session 7: Social (in)justice and food systems

Chairs: KARNER, Sandra, IFZ – Inter-University Research Center for Technology, Work and Culture, Graz, Austria

Fair and equitable benefit-sharing in the international law of the sea? Sustainable small-scale fisheries and marine technology transfer

DIZ, Daniela (1), NTONA, Mara (2)

(1) University of Strathclyde Law School, Edinburgh, United Kingdom (2) University of Strathclyde, Edinburgh, United Kingdom

Sustainable fisheries management directly contributes to the maintenance or restoration of a wide range of ecosystem services, which are of increasing importance for meeting current and future human needs. For instance, poorly managed catches of protected, endangered or threatened species represent an economic cost to fisheries, particularly in developing countries, both through a loss of amenity value of charismatic species, and through the generation of negative perceptions of the products of the fishery. Moreover, key ecosystem functions and services can be disrupted by the collapse of certain species within their respective functional groups. For instance, top predators have an important regulatory role in the food chain, and large-bodied species play key roles in nutrient cycling and sediment bioturbation. Therefore, identifying and adopting appropriate (effective and equitable) conservation and management measures for areas important for biodiversity and ecosystem services can contribute to food security and poverty reduction.

However, many barriers to sustainable fisheries exist, including data deficiencies, insufficient regulation and enforcement due to limited resources, overcapacity, ecosystem effects of fishing (e.g. habitat destruction), the frequent disconnect between social and ecological goals, and power imbalances often favouring industrial fisheries. Different approaches to mitigating the impacts of these phenomena have been elaborated, ranging from the implementation of technical measures and “land-all” schemes, to remote electronic monitoring (“CCTV”), development of discard atlases and real-time closures. Moreover, in acknowledgment of the significance of healthy functioning ecosystems for maintaining the productivity of fishery resources, management methods which assess the spatiotemporal limits of sustainable habitat loss are being developed where there is already extensive information on habitat sensitivities and fishing pressure available. This contribution will thus consider how the knowledge gained from such studies and methodologies can be effectively transferred to support fisheries management in data- and capacity-limited situations.

In doing so, it will shed new light on the bottlenecks and opportunities in international law to

increase scientific knowledge, develop research capacity and transfer marine technology, with a view to contributing to the enhanced implementation of the UN Convention on the Law of the Sea (UNCLOS) in accordance with Sustainable Development Goal (SDG) 14 on the conservation and sustainable use of marine resources. To this end, this contribution will reflect on the findings of the World Ocean Assessment on the need for knowledge and infrastructure to effectively regulate uses of the oceans and ensure compliance. Moreover, based on the Assessment's findings concerning capacity-building needs to conduct integrated and ecosystem-services assessments, this contribution will interrogate the notion of ecosystem services to understand and prioritize the multi-scalar needs to be addressed by international scientific and technological cooperation in relation to sustainable fisheries, including the need to take into account the interests and needs of humankind as a whole and particularly those of small-scale fishing communities (SDG 14.b).

Such an analysis will include considerations of international environmental and human rights law. We will therefore explore ways to move away from the current logic of exchange and the ad hoc approach to the implementation of the general obligations foreseen by UNCLOS, through interpretation and implementation modalities that contribute to building long-term global partnerships (SDG 17) for sustainable fisheries and poverty alleviation. To this end, this contribution proposes to rely on fair and equitable benefit-sharing obligations established under international biodiversity law and seemingly emerging under international human rights law (with regard to the still controversial right to development, as well as the right to science, right to international solidarity and the right to food) to lay the basis for concerted, dialogic and iterative processes for identifying and allocating economic, socio- cultural and environmental benefits among state and non-state actors. This contribution also addresses lessons learnt in multilateral benefit-sharing arrangements, focusing on emerging institutionalized approaches to broker cooperation with a view to responding to identified needs and ensuring more equitable distribution across different regions, as well as to facilitate interoperability among and accessibility of existing information systems.

Keywords: technology transfer, law of the sea, fisheries, biodiversity, capacity-building, marine scientific research, Sustainable Development Goals, ecosystem services

Rice biotechnology and sustainable agriculture in India

KUMAR, Avinash
IAS-STS Graz, Austria

India faces serious challenges in the areas of food, environment, and health. Productivity based on the green revolution has reached a plateau and substantial yield gaps still persist. With the appearance over the last decade of a set of new and uniquely powerful agricultural biotechnology especially molecular/genetic technologies has brought profound implications on both scientific community (laboratory-based) and farming community (field-based). This set of new technology is perceived as a solution to issues such as food security, changing climate, and shrinking environment resources. However, the emergence of genetic technology and the ushering in of a new institutional framework guided by the Intellectual Property Rights regime

have further contributed to the conflicting debates on appropriate technology. It is against this backdrop, and from the sociology of science and technology perspective, that my research presentation reviews the various strategies implemented by the Government of India over time to promote sustainable agriculture. Empirical data was collected through in-depth personal interviews with rice biotechnologists from selected agriculture institutions coming under the aegis of State Agriculture Universities (SAUs) and the Indian Council of Agricultural Research (ICAR). The present study, through the lens of sustainable agriculture, captures the transformation in rice research that has emerged with the application of new agriculture biotechnology and how it is conceived and practiced by scientific communities in an agricultural dependent country such as India. By focusing on a galaxy of scientists engaged in rice biotechnology, the present study elicits the response of the scientific community on questions surrounding genetically modified crops in light of their social, economic, and environmental impacts- the three pillars of sustainable agriculture. The results suggests that there is lack of consensus among the rice biotechnologists over the potentiality of GM technology to promote sustainable agriculture in India. Based on empirical data, this paper focuses on the potential of non-controversial, genomic-based marker-assisted selection
(MAS) technology for addressing biotic and abiotic stresses, and yield enhancement in agriculture. MAS has emerged as non-proprietary technology, which is being integrated into rice cultivation, and contributing to the goal of sustainable agriculture practices in India. MAS has the potential to promote more inclusive and user-centered innovations in agriculture sector in India.
Keywords: agricultural biotechnology, green revolution, GM technology, sustainable agriculture, marker- assisted selection (MAS)

Reshaping sustainable production in a global age: a case study of the 'good food movement' in China

ZHANG, Joy
University of Kent, United Kingdom

Having the world's largest population to feed, the Chinese government was keen to establish a biotechnology- and agrochemicals-assisted agro-industry so as to 'take good control of its own bowl'. Yet, the irony is that the more secure Chinese domestic food production is, the less safe its food has become. In fact, some have lamented that China has arrived at the 'Chemical Age' for food. In addition to severe water and soil contamination as a result of aggressive industrialisation, China is also the world's largest consumer of fertilisers and pesticides.
In response to growing social anxiety and distrust, in recent years, grassroots explorations of alternative food system started to appear in some Chinese cities. There is no official name for this nation-wide campaign and there is no hierarchy of command among this group of closely networked but independently run grassroots efforts. But I dub the name, the 'Good Food (Liang-Shi) Movement', for all of these civic initiatives subscribed to the pursuance of 'liang-shi, liang-ren, liang-xin'. Literally translated as 'good food, good people and good heart', the shared aim for these Chinese urbanites is to improve risk resilience of the contemporary food system through invoking the public's reflections on and re-orientations of power relations in the

production of food.
Based on 8 focus groups and 15 interviews with relevant Chinese stakeholders, this paper demonstrates that the success of the Good Food Movement is not only due to their tapping into expanding social anxieties over food safety, but also owes to their openness to world experiences. International practices, such as community support agriculture in North America, the participatory guarantee system in Europe, and the idea of solidarity economy from Latin America, gave the Movement initial inspiration on how to reform the food system. More importantly, the organisers and affiliated producers are highly reflexive and selective in what to take from these international lessons.
I argue that as grassroots NGOs expand their influences in major Chinese cities, the intensified socio-political contention over safe and sustainable food production sheds light on how emerging performative food communities facilitie a 'bricologe' of different stakeholders and re-anchors social resources in collective response to social and ecological vulnerabilities in a global age.
Keywords: social movement, food safety, social sustainability, community, China

(Un)Certified promises. An exploration to the ambivalences and inequalities in the infrastructures of sustainable coffee in Colombia

SANCHEZ VARGAS, Derly
Lancaster University, United Kingdom

Claims of social and environmental sustainability have transformed the narratives about the future of the production of agricultural commodities such as coffee. A crop depicted as a commodity in crisis. Low prices, market volatility, increasing production costs and climate change are some of the factors that have made dark the future of coffee for investors, governments in the South global and producers, despite the increasing demand for coffee in the North. In this context, sustainability standards have come as a solution to these problems whilst at the same time have promised added value. This paper thesis explores the infrastructures that these standards produce, ambivalences and inequalities that they generate with the 'traditional' production of coffee in Colombia.
I base this work on diverse sources including Standards Norms —including technical literature— interviews with auditors and certification consultants, ethnographic moments in auditor training sessions, standards setting processes and International conferences, farms and coffee estates visits in Colombia. I show how the Sustainability Infrastructures that sustain certification processes are not invisible. On the contrary, their visibility is deeply entangled with their character of their promises. Sustainability Standards promises on adding value, nature protection and fairer working conditions in coffee production, are shaped and entangled with the practices they create to produce sustainable coffee. Moreover, I show how such promises are built into infrastructures and mediated by managerial knowledge, development narratives that demand specific modes of organising/enacting sustainable practices. Drawing on the work of science and technology studies on infrastructures (Star and Bowker, 1999; Bush, 2011); standards as a form of organisation (Brunsson and Jacobsson, 2000) and the anthropology of

the global connections (Tsing, 2015), I present the different organising practices that infrastructures of sustainability standards. This in connection with the promises in which they built their legitimacy. Specifically, I explore the enactment of the 'social' as a category by analysing the calculations and negotiations about living wage in coffee certification. I show the enactment of sustainability standards as lists by presenting some of the tensions that surge in the audit of banned pesticides in coffee production and the trade-off of producers between norms and practical commitments with the crop. Finally, I describe the affective economy of sustainability as added value. I analyse 'profit' as a promise and its materialisation in the re-organisation of the farm following an industrial model temporality medicated by management.
This presentation contributes to science and technology studies and Organisation studies by devising methods to research the relationships between standard infrastructures and the contemporary politics of commodity production. These conceptual and methodological tools allow the politics of sustainability and coffee production to be traced. This research extends social studies of sustainability standards by exploring the Colombian experience in its reception and adaptation. Finally, it contributes to the social sciences literature about coffee production by analysing the role of sustainability standards in reshaping global markets and in enacting promises of 'development' and 'social justice' in a crop that has been key for Colombia as coffee producer.
Keywords: standards, coffee production, sustainability, certification, Colombia

Socio-materiality of quality. Symmetric analysis of four polish alternative food networks

GOSZCZYŃSKI, Wojciech, WÓJTEWICZ, Anna, WRÓBLEWSKI, Michał
Nicolaus Copernicus University, Torun, Poland

Researchers emphasize that there are two sides of contemporary food systems. At the one hand there is industrial or super-industrial mode of production: quantitatively efficient, vertically separated, dependent from resources. At the other hand there is alternative model: which refer to social and moral values, reflexive locality, civic participation of different actors. In our presentation we want to focus on the second model. One of the most important aspects of emerging alternative food networks is their hybrid character. Those networks merge different kind of knowledge, rural and urban actors, classes, technology and culture, devices and consumer's practices. Alternative food networks are also related to notion of quality. The quality turn is useful sociological tool to look at the scope and nature of consumer-producers behaviours in late capitalism. This concept moves the attention from the economical effectiveness onto considerations on the nature of social relations and goods produced by the contemporary economy. Theoreticians of the quality turn argue that in the new, socialised model a more important role is played by new active actors whose knowledge, experiences, connections and values are going to determine the food production and consumption systems. This leads us to the aim of this paper: how food quality is constructed in Polish alternative food networks? How Polish producers, processors and consumers are reconfiguring socio-economic micro-universes and what role, in this process plays: hybrid knowledge, products, devices,

consumer practices, traditions, institutions and specific civic models. How far Polish consumer and producer practices are concerned with moral economy, ecology and local community or alternativeness and how far are this alternativeness is just way to brand a product? To what degree specific understanding of quality in alternative food networks determine the relations of power between producers and consumers?

Keywords: quality turn, materiality, alternative food networks

Food system research as a matter of social justice

KARNER, Sandra

IFZ – Inter-University Research Center for Technology, Work and Culture, Graz, Austria

Researchers may overtake an important role in supporting social justice goals in conceptualizing food system research as a matter of social justice, and by developing critical thinking skills that can redress existing inequalities (c.f. Allen 2008). Inequalities and exploitation occurs throughout the whole food system, thus considerations of social justice may be incorporated in researching nearly any aspect of the food system. Moreover, since phenomena of injustice are not only rooted in the food system, but refer to a wider societal context of injustice research on food systems that goes “beyond food” can be used as a lens for investigating the broader structural context, and the ways in which societal differences are produced and reproduced, both discursively and materially. Against this background, critical investigations on the potential of alternative food system practices may also help to provide insights in how to drive substantive changes in social and political issues “beyond food”.

However, when it comes to research’s contribution to transforming the food system, not only the subject of research, such as research on alternative food systems, matters. As suggested by Patricia Allen, researchers can also challenge ideological categories of inquiry and problem definition, include justice factors in defining research problems, and develop participatory, problem-solving research within social justice movements (ibid:157).

Yet, current food system research frequently does not meet the fundamental criteria of social justice, such as access to equal opportunity. By being bound into the power structures of conventional research, researchers and actors affected often perpetuate power relationships and hierarchical epistemologies in knowledge production. Consequently, even participatory research aiming at facilitating societal change it is often characterized by a limited participation of marginalized societal groups those with less power, often going along with less education.

Drawing on my personal experiences with food research, the presentation wants to trigger reflections on the role of our research in embracing the discourse of social justice and catalyzing societal change, particularly on how research processes itself may lead to enhanced societal relevant outcomes.

Keywords: food systems, social justice, role of research(ers)

STREAM: The Mobility System and Social Justice

Session 8: Demand responsive transport systems (DRTS) – a possibility to enhance social (mobility) justice in rural areas?

Chairs: SUSCHEK-BERGER, Jürgen, GETZINGER, Günter, Alpen-Adria-Universität Klagenfurt|Wien|Graz, WICHER, Magdalena, IFZ – Inter-University Research Center for Technology, Work and Culture, Graz, Austria

A Strategy for Demand Respond Service Systems (DRTS) in Styria

GETZINGER, Günter (1) SUSCHEK-BERGER, Jürgen (2)
WICHER, Magdalena (2)
(1) Alpen-Adria-Universität Klagenfurt|Wien|Graz (2) IFZ – Inter-University Research Center for Technology, Work and Culture, Graz, Austria

In rural areas (lower population density, disparate settlements, challenging supply structures, topographical challenges, etc.) and industrially oriented regions public line-bounded transport is often abandoned due to economic inefficiency. Mostly social disadvantaged people (elderly but also young people, single parents, economically disadvantaged and disabled) are affected by this problem in non-urban areas. It is often not possible for them to fulfil their mobility needs and taking part in social life (e.g. use of medical treatments, everyday shopping or visiting social events) without owning a vehicle or being dependent on relatives, friends or neighbours. It is also a question of social equality to offer all groups of population the same chance to take part in social life and to stay flexible and mobile. Therefore, we need new forms of (public) mobility services, one of which are demand responsive transport systems (DRTS). In Austria, these systems are called “micro public transport systems”, a form of public transport, which is used for smaller rural regions where no (line-bound) public transport is available. Systems are organized in different ways (e.g. over the municipalities or associations) but in most cases users call the driver or a central office which offers the possibility to use transport on demand at a cheap rate.

The province of Styria supports Styrian Communities which want to install a micro public transport system with financial funding. For this reason a Demand Responsive Transport Strategy for the whole country was established and support guidelines were developed. The Strategy is based on seven principles and defines what is meant by DRTS in Styria. The guidelines define the height of the financial support and the requirements how to get it. The strategy and the guidelines were developed in a very participative way including stakeholders, representations of interest and representatives of the communities.

The presentation gives an overview of the results of the strategy and the content of the guidelines, describes the way of participation, discusses the matter of social equality and gives some recommends for establishing DRTS.

Keywords: mobility, demand responsive transport systems (DRTS), participation, social justice

Mobility as a basic principle in rural areas – success factors for implementation of alternative mobility supplies

BRANDL, Hannes, FREWEIN, Markus
verkehrplus GmbH, Austria

Mobility as a basic principle of existence in rural areas is influenced by different impacts of the demographic change – an extensive preparation of equal and high-quality mobility supplies seems to be impossible by typical mobility options (e.g. public busses) in present days. Based on insufficient (economic) capacity and the lack of acceptance and demand, the public transport options are declining. Therefore the dependency on the motorised private transport resp. on private cars, including the motorisation rate, is rising in rural areas. In this project the stress field of the topics of individual mobility needs, rural areas and mobility supplies is examined. In particular, the synthesis of these topics implies significant potential, in addition with decision-maker's perspectives, to identify success factors for the implementation of alternative mobility supplies. The outcomes of the project may interest and influence decision-makers, higher authorities (e.g. funding institutions) and planners. Therefore, the research questions in three sections need to be answered: Meaning of reachability in rural areas, level of decision for micro-PT and level of implementation of micro-PT. The methodological approach can be divided in three parts, which are interacting through feedback loops:

1. The Questioning of decision-makers in municipalities brings a status of the current atmosphere towards alternative mobility supplies (N=287, n≈100).

2. Analysis and comparison of case-studies(14 implemented micro-PTprojects in Austria) considering qualitative and quantitative data explore the functionality of successful projects in operation.

3. Depth interviews with 4 project leaders of implemented micro-PT supplies adds the final touch for the implementation of alternative mobility supplies.

General strategies, action principles and key factors for an effective possibility to initialise, plan and implement alternative mobility supplies in rural areas are the main outcomes of the project. Opportunities and barriers for planning or implementing of these principles are focused. The ideal combination (spatial, temporal and informative) of alternative mobility options with other mobility options (public transport, non-motorised private transport, motorised private transport) is going to be developed. Key aspects considering the responsibilities for the preparation of necessary mobility supplies in rural areas are examined. The close link between practice (planned and implemented projects) and a scientific approach (analysis and synthesis) allows the development of valuable basics as the main outcome for initialisation, planning and implementation of alternative mobility supplies. Based on the outcomes of the project instructions for the use of a planning tool for alternative mobility supplies are going to be developed. Interim results show that - micro-PT supplies contain a great freedom of design, - framework conditions have a big influence on micro-PT projects, - micro-PT supplies can be described by a big range of quantitative - characteristics and micro-PT is a niche solution.The

high cost for micro-PT are accepted due to socio-political perspectives and these alternative mobility supplies are a small but important element in the mobility system.

Keywords: alternative mobility supplies, rural areas, initialisation, planning and implementation, demo- graphic change, micro-PT

Autonomous vehicles in DRTS - benefits of risks for mobility justice

SEIBT, Claus (1), PFIEGL, Reinhard (2)

(1) Transforming Mobilities, Germany (2) A3PS, Austria

Recently there is a upcoming technology and innovation debate on autonomous vehicles (AV). This debate is as well strongly accessing the discourse one demand response transportation systems (DRTS), in particular in rural areas. Autonomous mini-busses as feeder systems to main transit hubs like railway and bus stations or from disperse rural settlements to rural town and village centers are intensely addressed by research and innovation action.

AV systems are visionary and promising to revolutionize public transport in rural areas and revolutionizing the transport and mobility sector as such. The vision and political utopia of such people and goods moving systems is highly promising - to have in practice trans-portation opportunities easily available on demand without owning the transportation mean (in particular reducing car ownership). AV systems are easy accessible for the youngest as the very old. AV systems are even no more claiming for a driver license.

However, in all this innovation debate, for example, the additional costs and affordability to travel by AV systems are not sufficiently calculated. AV systems driverless and on demand may be technically feasible, but the operation of AV systems in public transport may despite of driverless still need attendance and support. In particular in disperse rural settlements and ageeing society this attendance may not be performed by centralized attendance like for example for driverless metro systems in urban areas.

Social and gender justice issues regarding AV systems will be the main focus in this paper. In addition a sociologcical perspective (resonance theory) will be taken looking at DRTS. And the question will be raised, if instead of such high-technology AV and mobility as a service" (MAAS) systems utopia, DRTS will be as well in rural areas in Austria and Europe driven by an "informalisation" of the transport sector, like it is still common in most developing countries around the world. And this is raising new and different questions on social justice in mobility and transport.

Summary: The paper will discuss social justice issues visioning autonomous vehicles (AV) for demand oriented public transport as DRTS in rural areas. The paper will assess potential benefits, risks and uncertainties of AV implementation and comparing with other scenarios for DRTS.

Keywords: DRTS, Autonomous Vehicles (AV), mobility justice, informalisation of transport

Demonstrating automated transport systems in local contexts: the case of CityMobil2 in Trikala

SIDIROPOULOS, Viktor, PANTELIADIS, Taso
Department of Science and Technology Studies, University of Vienna, Austria

Context

Mobility is a key factor for a society that aims to enhance inclusiveness and justice (European Parliament, 2015). Several innovative suggestions are promoted every day. Technological shortcomings and barriers are gradually overcome, providing the chance for further developments in the domain. However, the limited usage of mobility systems, as the atmo- spheric/ pneumatic railway and the personal rapid transit, signalize that technical aspects are necessary but not adequate conditions for the introduction and robust establishment of new transportation systems. The experience in introducing new transportation systems has rather shown that social, political and cultural aspects are omnipresent during such processes.

Question

In this context, we intend to discuss a case, which explicitly addresses those issues. Our presentation will focus on the experience drawn by the CityMobil2 project, during the demonstration of its automated buses in the Greek city of Trikala. We will try to put this in a perspective by asking:

How was the demonstration of the automated buses (CityMobil2) implemented by the local authorities in Trikala?

Case

CityMobil2 was an EU funded, multi-stakeholder project designed to assess the benefits of a possible implementation of automated vehicles as feeders to the already existing public transport. In this direction, demonstrations of the performance of driverless buses took place under real urban conditions. Trikala, a small rural city, was one of the three sites where large scale demonstrations took place from November 2015 to February 2016. The construction of a separate driving lane, a network of fiber optics and a control center would ensure the successful operation of the automated bus, at least concerning its technical facets. Though, the project was not limited in building the materially necessary infrastructure for the automated buses; next to the departing point an exhibition titled “The car in Ancient Greece” was set in collaboration with a renowned museum of Greek Ancient Technology. Along with the exposition of ancient technological artifacts, visitors, composed mainly by pupils, had the chance to see the automated buses, take pictures with them and attend a traffic educational program, organized in the framework and for the needs of the demonstration.

Argument

The automated bus is a technology holding the promise of more socially inclusive futures. By describing the case of Trikala through an STS scope, we can form the plausible argument that the efforts to demonstrate the technology are associated to the disruption –a disruption that goes beyond technological paradigms- that this artifact poses to established social patterns. In that sense we identify automated transport systems as Large Technical Systems (Hughes, 2000). Exactly because of their disruptive character, the introduction of such technological systems, regardless their potential social benefits, requires legitimization.

References:
European Parliament (2015). Social Inclusion in EU Public Transport. Policy Department B: Structural and Cohesion Policies.
Hughes, T. (2000). Rescuing Prometheus: Four Monumental Projects that Changed our World. New York: Vintage.
Keywords: driverless buses, CityMobil2, automated transport systems, technological legitimization

Who gets to decide? Developing a policy for automated driving in Austria – a critical assessment

WHITELEGG, Kathy
AIT – Austrian Institute of Technology, Austria

The “Strategie zum Automatisierten Fahren” or in english the “Strategy for Automated Driving“ was presented in 2016 as a plan developed jointly by industry, research, cities and counties. Its main aim was to develop a common strategy for the implementation of automated driving in Austria and to design individual measures and a time plan for their implementation.
However, an analysis of the process behind the development of the strategy reveals an interesting mix of technology push and corporate interests on the one side and a lack of broader vision and leadership on the other. Despite the fact that the final document states that the strategy will lead to a more efficient and safer transport system, the suggestions of the way in which this should take place are examples which on further examination are not integrated into any other policy contexts. It is merely assumed that the implementation of new technologies will automatically lead to the anticipated benefits.
An analysis of the actors involved in the process, also supports this observation. The process was dominated by industry representatives with vested interests in creating spaces to develop and test certain technologies. For many other actors who could have taken a broader view, the subject area was too technical and too far away for them to have a view and to be able to participate.
The question here is, does this matter? Does it matter that strategies are being written pertaining to be aimed at achieving certain environmental and societal aims, but that are more focused on creating spaces for the development of certain technologies. Does it matter that there was little leadership from the public sector and little interest in agenda setting of an emerging technology? The main contribution to this conference is too look at how far away the development of this strategy is from the real issues.
Keywords: automated driving, policy analysis, inclusive decision making, policy integration

Session 9: Cycling Cultures

Chair: Bernhard WIESER, Institute for Science and Technology Studies (STS), Alpen-Adria Universität, Klagenfurt|Wien|Graz, Austria

Suitability and accessibility of bikesharing in Africa

PREUNER, Philipp
HafenCity University Hamburg, Germany

In line with the New Urbanism paradigm, bikesharing has become popular in many European cities. The supply of bikes to the public is municipally subsidized in many cases and used both by local residents and tourists. By making cycling more user-friendly and accessible, it contributes to a decreasing number of cars in the city, and thus to an improved air quality. Issues like road congestion and air pollution are of growing challenges in rapidly urbanising world regions even more. Through a global best-practise culture in urban planning, interventions like bikesharing are considered to tackle such challenges alike. However, interventions that proof effective in Europe are not de facto suitable to any urban metabolism per se. Weak institutions, lack of bike infrastructure and low social status of biking practise determine the context for cycling in many African cities. This does not necessarily mean that there is no potential for biking. However, policy makers should rather prioritise the basic infrastructure to advance urban interventions like bikesharing. In the long term, the potential not only lies in less traffic and better air, but could also improve social equity and fight segregation due to the affordability of bikes compared to cars for the majority of the population. Based on the findings of a research project in 2016 and along the example of an app-based bikesharing pilot at the University of Nairobi the paper aims to illustrate socio-technical aspects of biking in an African city. It will discuss how the project uses public participation in order to propose a design, promotional technics and implementation methods which might suit best the local context while also relying on best practices around the world. It will demonstrate the daily challenges for residents in terms of transportation, be it congestion or safety concerns in public transit, as well as the potential major outcomes of a public bike-sharing system in Nairobi, for a social, planning and transportation point of view. The paper will as well look into the innovative processes used to start that bike-sharing project at the University of Nairobi, and how such processes could have repercussions in other African contexts.

Keywords: bikesharing, best-practise culture, new urbanism, urban metabolism, Nairobi

Mechanisms, apparatuses, cyborgs and actors: The bicycle as social machine

CZURDA, Klemens
Karlsruhe University of Arts and Design (HfG), Germany

The bicycle is one of the most prevalent options of augmenting human motion and a major mode of individual transportation around the globe. Yet, our relation to this almost omnipresent device of the urban landscape has scarcely been analyzed from a point of view that allows the interpretation of this technology as an "acting" machine. The paper outlines the bicycle as a construct of technology embedded in society. Starting from an historical overview of what became to be the contemporary bicycle, it moves on to the transition from the bicycle as vehicle towards a device of the leisure society. It spans an arc from the bicycle under the aspect of Marxist' view onto machines, the Apparatus in Flusser's sense towards Canguilhem and his idea of a Mechanism, Clynes' Cyborg concept and Latour's Actor-Network Theory. The future and contemporary development of bicycles – emerging technologies such as embedded engines, linked devices, wireless shifting and how these change the bicycle within the given concepts – conclude the paper.
Keywords: bicycle, machine, apparatus, cyborg, mechanism

Carbon, carbs and care: The footprint of cycling

WIESER, Bernhard
Institute for Science and Technology Studies (STS), Alpen-Adria Universität Klagenfurt|Wien|Graz, Austria

Desired, idealized and faced with high expectations the bicycle lies at the heart of sustainability concepts. Far beyond its potential as an ecological and healthy means of transportation for urban mobility the bicycle is a symbol for a post-fossil society. Yet, a closer look reveals that the bicycle is by no means without carbon footprint, neither in its use nor in its produc- tion. Moreover the bicycle depends on built environment which again requires resources for its construction, maintenance and use. In my contribution, I aim to outline factors that help to assess the bicycle with regard to its sustainability potential. In particular, I will look into production, and patterns of use. I will highlight that practices of repair, replacement and disposal are crucial in the ecological performance of the bicycle as a manufactured product. In such a way, I aim to contribute to an understanding that goes beyond the bicycle as a seemingly emission free means of transportation. Along these lines, it becomes clear that there lies a great potential in improving patterns of use in order to make the bicycle a more ecological material object. I will conclude that, sustainability policies need to pay more attention to support actions that promote repair practices and longer cycles of use than merely focussing on urban infrastructure investment in order to encourage bicycle use.
Keywords: sustainability, production, patterns of use, repair practices

STREAM: Towards Low-Carbon Energy Systems

Session 10: Sharing local energy and regulatory responses to it

Chairs: BUTENKO, Anna, University of Amsterdam/ Tilburg University, Netherlands, SAINTIER, Severine, University of Exeter, United Kingdom

Competition law aspects of the sharing economy: challenges and opportunities for energy prosumers.

DASKALOVA, Victoria
Twente University, Netherlands

There is much policy interest in energy prosumers and yet their legal status remains unclear. For one thing, as noted by the European Parliament, no common definition of 'prosumer' exists. The term is used in the literature to describe rather different actors: from single-home installations by private individuals to large-scale PV installations such as those put in place by municipalities or by commercial operators. From a legal point of view, there is also some uncertainty as to which rules apply to prosumers. This is because prosumers wear two hats – that of a consumer and that of a producer. There is some literature on the status of prosumers as 'consumers'; yet, the applicability of commercial law to prosumers remains under-studied.

This paper focuses on the applicability of competition law to the commercial activity of prosumers and the implications for sharing energy. Firstly, it explains why prosumers fall within the scope of the competition provisions. To do so, it investigates the scope of the term undertaking and how it applies to energy prosumers. Secondly, it discusses the constraints that flow from the applicability of these provisions for the arrangements necessary for sharing energy, in particular the rules on collaboration between competitors. However, competition law is not only about constraints. In a third place, the paper focuses on the role that competition law could play in regulating decentralized energy markets with atomistic prosumers. The argument made is that competition law is a tool that promises not only market access but also fair outcomes. Finally, the paper discusses the shortcomings of EU competition law and some complementary regulatory strategies – public and private – which could be used to bolster the regulatory framework.

Keywords: prosumers, antitrust, agreements between competitors, abuse of dominance, regulation.

Sharing Energy: Dealing with regulatory disconnect in Dutch energy law

BUTENKO, Anna
University of Amsterdam/ Tilburg University, Netherlands

While sharing economy services enabled by digital platforms such as Uber and Airbnb are on the top of the current academic discourse, similar developments in energy go largely unnoticed despite their potentially significant effect on the current energy market design. The decreases in price and increases in efficiency of energy supply and small-scale storage equipment lead to energy consumers increasingly becoming prosumers of sustainable energy. The increased tempo and availability of digital solutions, such as online platforms, also impacted the prosumers: It became technically possible to trade energy on the local and national energy market- for example, by the means of supplying one's neighbours or relatives in another city. Thus, the role of the prosumers effectively expanded to include besides the previous parallel roles of energy consumers and producers also the roles of suppliers and traders.

The activity of prosumers on the local energy market, which presumes that energy is both produced and consumed within the same geographical region and preferably at the same time (simultaneously), is endorsed as the preferred scenario at both European and Dutch national levels. Against this background a question arises, and namely: To what extent is it possible to 'share energy' under the current Dutch regulatory framework? In order to answer this question, the 'match' between the current developments on the Dutch energy market (prosumers assuming an expanded role) and the respective regulation is assessed from the perspective of regulatory disconnection. The latter could arise when innovation in the market develops in a faster tempo or differently than envisaged compared to respective regulation. The regulatory disconnection is not automatically problematic, but in certain cases it could lead to regulatory failure and should be eliminated.

The regulatory approaches to bridging the gap between innovation on the one hand and regulation on the other hand could be roughly divided into three distinct categories: those addressing the horizontal dimension of disconnect by the means of adjusting the timing of regulatory intervention, those addressing the vertical dimension by changing the level of regulatory generality, and those pertaining to the institutional dimension by introducing regulatory agencies and by performing regulatory updates and reforms. In this vain, and in order to be able to answer the main research question posed earlier, the current paper also aims to assess whether there is indeed problematic regulatory disconnect between innovation and regulation, and which regulatory approaches are chosen by the Dutch government to address this disconnection.

Summary: The activity of prosumers on the local energy market, which presumes that energy is both produced and consumed within the same geographical region and preferably at the same time (simultaneously), is endorsed as the preferred scenario at both European and Dutch national levels. Against this background a question arises, and namely: To what extent is it possible to 'share energy' under the current Dutch regulatory framework? In order to answer this question, the 'match' between the current developments on the Dutch energy market (prosumers assuming an expanded role) and the respective regulation is assessed from the perspective of regulatory disconnection. The latter could arise when innovation in the market

develops in a faster tempo or differently than envisaged compared to respective regulation. The regulatory disconnection is not automatically problematic, but in certain cases it could lead to regulatory failure and should be eliminated.

Keywords: prosumer, energy consumer, sharing economy, peer-to-peer transactions, regulatory disconnection

Blockchain technology in the electricity system – abolishing incumbent regulatory actor typologies

DIESTELMEIER, Lea
Faculty of Law University of Groningen, Netherlands

With the rise of the idea of smart electricity grids one of the pressing regulatory questions has been how to integrate various new actor typologies in the electricity market. So far, the influence of new actors, often referred to as 'prosumers' and aggregators, remains limited or fully absent as their role as an independent market participant is barely or not facilitated by electricity market regulation across EU countries. Blockchain technology opens the opportunity to change the approach of 'integration in the market' into 'being the market'. This paper explores the potential role of blockchain technology in the electricity sector for example as facilitator of peer-to-peer electricity supply and as new technology to maintain system operation. Currently, electricity supply and system operation are strictly regulated by assigning clear responsibilities to well-defined actors. Blockchain technology dilutes those clear-cut lines and thereby provokes the regulatory question how to allocate responsibilities for electricity supply and system operation under a blockchain-scenario.

Centrally organised business models are challenged by new forms such as 'Airbnb' and 'Uber' which offer decentral services (private homes and cars), yet, the conclusion and payment of the transaction remains at a centrally organised platform. Blockchain technology offers not only a decentral service provision, but also handling transactions decentral. "The trust machine" titled an article of 'The Economist' pinpointing the idea of blockchain technology, that is cutting out the middleman and enabling true peer-to-peer transactions in various sectors. Essentially, blockchain technology can be described as a digital, decentralised, and transparent ledger which is shared among all users and not in control of a single actor. 'Bitcoin' is the most widely known application of blockchain technology which enables financial transactions without central banks as facilitator. Instead, transactions are recorded on 'blocks' which each refer back to the previous 'blocks' and thereby create a 'chain' which cannot be altered as all users act as verifiers. Trust in transactions is thus inherent in the design of the technology and abolishes the need for a middleman to act as verifying institution. In the electricity sector the middlemen are the supply companies and system operators by connecting producer and consumer, contracting responsibilities and supply services. First reports explore the potential of blockchain technology for the electricity sector and, despite merely observing an initial phase of emergence, overall conclude that blockchain technology can facilitate peer-to-peer transactions also in the electricity sector. This promises to coordinate dispersed persons offering or demanding electricity supply and services, thus a decentralised market setting. In that sense,

the question is not how the industry will implement blockchain technology, but how blockchain technology will compete and contest with existing companies and markets. Necessarily, this also requires to fundamentally rethink the regulatory allocation of responsibilities in the electricity sector and to develop new forms of regulation which captures the intricate nature of blockchain technology as enabler of peer-to-peer electricity supply and system operation.
Keywords: electricity, blockchain, peer-to-peer, regulation, responsibilities

Exploring the role of community energy companies in the quest for 'social (energy) justice'

SAINTIER, Severine
University of Exeter, United Kingdom

Following the rise of renewable energy sources (RES), regulation in the UK and European energy sector is no longer the preserve of either the state or the market. The UK and the EU appear to welcome such a vision of citizens and local actors regulating where the state retreats. Yet, the regulatory dimension, at both levels, is not adapted to this multi-actor market, which creates two specific (but interlinked) problems. First, the regulatory gap in the governance of decentralised RES production by citizens, market and government actors fail to empower the 'prosumer'. Second, on the consumption level, 'services of economic general interest' are formally recognised in the Treaty of Amsterdam, and access to such services is protected by the Charter of Fundamental Rights. However, as the (Europe-wide) rise in energy poverty highlights, vulnerable citizens are not adequately protected either. Given the shared responsibility of the EU and the Member States in this field, a coherent solution throughout the sector must be found not only to empower 'prosumers' but also to achieve 'energy justice'.
In this light, the rise, in the UK, of Community Interest Companies (consumers and local actors' collectives) in the energy sector provides an interesting perspective: by providing a link between consumption and production, they allow a whole systems' view. It is therefore the aim of this paper to assess whether this exemplar of 'the rise of a social sphere in regulation' could be used as a model for a more social approach to the governance of economic relations. After critically assessing the current regulatory position, specific examples of shared ownership in the energy sector in the South West of England will be considered, to assess whether the cooperative model, through its interactions between consumers/citizens and communities can help provide a more coherent approach to the multi-actor governance and help navigate the difficulties that the area brings.
Keywords: community interest companies, England, social justice, renewable, sharing economy, regulation, governance

What powers success on the ground? The gradual reform of electricity distribution in Gujarat

SAREEN, Siddharth
Erfurt University, Germany

Among Indian states, Gujarat's electricity distribution sector has come to be regarded as exemplary. Its distribution companies have A-plus credit ratings, acceptably low loss levels, and provide 24x7 power throughout the energy surplus state, with separate feeders for up to eight hours a day of agricultural supply. Reforms enacted in Gujarat subsequent to the national Electricity Act of 2003 have now been initiated nationwide. What are the factors that have made this sector such a successful model and what particular set of circumstances enabled them to work in Gujarat? Are there shortcomings that are glossed over in the dominant narrative on its performance, such as the slowdown in solar energy growth despite Gujarat's championing role in this regard even prior to the national solar policy of 2011? Are the benefits uniformly distributed, or do some stakeholders continue to benefit at the cost of others due to the present configuration of incentives and institutional structure? Based on 26 elite interviews and secondary research, this study addresses these questions, finding that Gujarat's gradual but substantive application of key aspects of reforms has been instrumental for its relative success in the distribution sector, eased by a favourable consumer mix and supportive policy environment. It however also notes that some roadblocks exist for a truly committed push towards objectives of social inclusion and adoption of distributed renewable energy, and points out the continuation of lacunae such as popular engagement with the sector. An encouraging picture of the sector emerges, especially pertaining to innovative and pioneering efficiency measures, but with scope for further gains such as yet more transparent accounting practices and a complete end to political influence within the regulatory structure.

Keywords: energy governance, sustainability transitions, institutional change, solar politics, electricity distribution, South Asia

Biogas and network companies in the Netherlands and Germany: a regulatory paradox

STEENHUISEN, Bauke, HOPPE, Thomas, DE BRUIJNE, Mark
Erfurt University, Germany

Feeding biogas back into high pressure gas networks is often critical for the financial feasibility of local biogas production projects. We have studied two cases in Germany and one case in the Netherlands where biogas producers team up with a network company in such a project. We used qualitative interviewing, desk research and on site observation. We specifically focused on how both parties deal with competing public values, based on a theoretical framework that acknowledges different assumptions of four scientific disciplines: neo-classical economics, institutional economics, law and decision-making. The comparison between on one hand the four disciplines and on the other hand the cases in two countries becomes extra interesting as

the regulatory conditions in both countries in the time of study show a great contrast, whereas the actual dilemmas and how both parties deal with them show very similar patterns. Do regulatory institutions matter? How to conceptualize their role in and contribution to the day-to-day decision-making behaviour when it comes to coping with competing public values? In our attempt to explain this paradox, we believe to have shed new light on the sense and nonsense of regulatory institutions for local energy initiatives, particularly in their contribution to trust relationships and informal cooperation.

Keywords: regulation, biogas

Session 11: Energy landscapes as contested terrain

Chair: FUCHS, Gerhard, University of Stuttgart, Germany

Energy landscapes as contested terrain – conflicts about renewable energy installations in Germany

FUCHS, Gerhard

University of Stuttgart, Germany

As Niklas Luhmann has stated, all social actions have a spatial, social, temporal and material side. All social action is somewhat spatiallly situated, but the relations between spatial, social, temporal and material aspects differ. None, of course, can be isolated from the other one. Usually social aspects trump aspects of space or physical proximity. There are some exceptions to this, e.g. persons who are living close together have a higher probability to meet, even if the social distance between them is great. Spatial aspects and material aspects intermingle in an especially interesting manner, when we look at siting conflicts. The nature around us means different things to different people. In a recent conflict about the question what to do with a huge area of land that for economic reasons was not used any longer for agricultural exploits, different options were voiced: Some wanted to preserve nature as an open field, some wanted to install solar panels on the open fields and still another group wanted to pour concrete all over the place and turn it into a major industrial storage area. In this case the third option won. While some argued that solar panels would destroy the traditional image of how we look at nature, the building of concrete walls around the new storage facilities won because of economic reasons. People react towards nature, but nature does not have the qualities of a meaningful acting person (other then I as an observer grant nature or what ever else there might be these qualities and with my profound knowledge of what things want, explains this to the other observers; the observed stuff will remain silent.) It is part of a relation that becomes established and which eventually will create new relations. The paper will analyze four different types of conflicts in which the relationship between social, spatial, temporal and material aspects plays out differently: two conflicts about wind energy installations, one concerning grid extension and one involving a bio-mass installation.

Keywords: renewable energies, Germany, conflicts

Discourses of change and challenge: green energy transition in Bulgaria

SCHIVATCHEVA, Radostina
IAS - STS Graz, Austria

More than a decade after the adoption of the European Union's (EU) first Sustainable Development Strategy, the actual implementation of national sustainable development and energy policies still remains a challenge. This challenge is particularly poignant for some Eastern European member-states, which have to undergo a wide-ranging 'greening' of their energy industries, while still struggling with the transition from centralized energy governance to a market one. The difficulties of the Eastern European states are further exacerbated by the fluid political context of the new democracies in which this process takes place. Bulgaria, an EU member-state since 2007, has to resolve particularly difficult challenges. The country is the poorest EU member-state; thus although the price of the electric energy is the cheapest within the EU, many Bulgarian citizens suffer from energy poverty. Consequently focusing on Bulgaria as an analytical case study of the challenges of the renewable industrial and civic energy adjustment will provide insights into the pathways towards energy transition within an Eastern European context as well as in other developing and democratizing states. Mirroring the European 2020 strategy, Bulgaria has also introduced a national 2020 strategy. However, the country has to address several very significant challenges: a). the existing energy grid needs extensive renovations and repairs; b). Bulgaria faces critical issues of energy affordability; c). the Bulgarian energy sector has been criticized for its 'low scientific and technological potential, focusing on conventional energy sources such as coal and nuclear energy' (Mancheva et al., 2012). The Bulgarian government has tried to address these pressing challenges by spearheading restructuring efforts, which have concentrated on seeking technological solutions in conjunction with state-centric administrative incentives. However, while there has been an abundant emphasis on the technological side of the energy transition, recognition of and involvement with the importance of the civic dimension has been lacking. The presentation is informed by an analytical perspective, which uses grounded theory and critical discourse analysis to explore the public discourses about: a) the industrial and civic transformations that the Bulgarian energy transition entails; b) the relative importance of the industrial vis-a-vis the civic transformations - i.e. which debate dominates the discourse and in what ways is its dominance justified; c) to what extent the social justice issue of energy affordability is part of the debate. The discussion strives to map the position of the citizen-consumer within the debate, while arguing that in order to successfully meet the challenges of sustainable energy governance, consideration should be given to both the industrial and civic dimensions of the Bulgarian energy transition.

Keywords: green energy, Bulgaria, energy affordability, industrial and civic transition

Assessing decision finding processes on siting decisions. A comparative perspective on local decision-finding processes in Austria

KAPELLER, Sandro, BIEGELBAUER, Peter
AIT - Austrian Institute of Technology, Austria

Before the background of the much debated transition to alternative energy forms, a large number of planning and siting decisions have to be taken, and yet large sums of money have been wasted in unsuccessful planning processes. In a study on six decision-finding processes on wind parks in Lower Austria we identified various different actors and perspectives which were involved in these conflicts, such as those of mayors, opposition parties, citizens' initiatives, local businessmen, landowners and the operating companies.
In general, the decision finding processes were rather disillusioning. Citizens had mainly been given the opportunity to participate in information evenings, where they were informed about the decision to build a wind plant, while their interests and perspectives barely were taken into account. Only when serious resistance against the plans had been voiced, especially by a citizens' initiative, public deliberation of some sorts set in.
Participation usually took the form of limited debates that ended up in referendums. In the ensuing election campaigns citizens' initiatives, political representatives and operating companies fiercely argued about climate change and renewable energy, the value of the local landscape and wildlife, the benefit for the community budget and the loss of value of real estate. But there were also those who saw the opportunity to get paid for renting their property, those who feared economic disadvantage for their business and those who had moved to a community, fleeing the crowded areas.
The impact of siting decisions on renewable energy plants goes far beyond a conflict between those who want to stop climate change and the so called NIMBYs (Not-In-My-Backyard). While most mayors see the urge to integrate citizens into such decision-finding processes, the effects of the processes were negative for the communities in many cases and did not lead to a positive participatory experience. Direct democracy in the ways carried out in the six cases therefore was no panacea and had a tendency to exacerbate the problems it was to solve.
The six cases have been selected in regard of a wide range of outcomes and circumstances and were examined through media and document research, as well as expert-interviews with the involved mayors, citizens' initiatives and operating companies.
Keywords: siting decisions, wind power, participation, direct democracy, Austria

The dynamics of energy networks for regional innovation

SCHAFFRIN, Andre, FOHR, Gabriele**,** NIETGEN, Tanja
EA – European Academy of Technology and Innovation Assessment, Germany

Networks play a crucial role in understanding social and economic phenomena. It is not only actors, may it be individuals or organisations, but other actors' influence and their interaction, that substantially shape system transitions. Social network analysis has therefore been of scholarly interest for some time now, intending to catch the characteristics of networks that might explain their different outcomes and systemic impact. Transition studies, on the other hand, have tracked pathways of change in social and technological systems. By distinguishing hierarchical system levels from niche to regime, strategic niche management, transition studies, and the multi-level perspective have successfully been applied to explain system change. But we still know little about how and when social networks evolve over time, just as we lack an understanding of their integration within and the interrelation with the system under transition. We argue that overall system change is significantly carried and forwarded through networks and interaction that build on knowledge and other specific resources. In this paper, we approach a framework of the conditions and pathways of networks within a system that correspond to and form system dynamics. It integrates different levels of analysis from network analysis and transition management, considering their respective success factors, and conceptualises a dynamic network perspective. As empirical studies of regional transition processes are dominantly post-hoc evaluations, our framework allows formulating hypotheses on how network dynamics shape actual outcomes of regional transition processes. Tools of network analysis provide the means to test these hypotheses and to make (preliminary) ex ante claims on the mechanisms of how social networks for regional innovation form and evolve within a dynamic social process. Doing so, we build on a recent publication by Schaffrin and Fohr (2016) using the perspective of dynamics of energy and innovation networks as a case to study. Innovations in the context of regional energy transition processes is understood as the implementation of new ideas, technologies, or solutions to the region which enables and stimulates a substantial process of regional development. We base our conceptual framework on a literature review of network theory, the social and technical transition perspective, and studies on success factors for regional energy transition processes. In a second step, we demonstrate the usefulness and conceptual soundness of the framework using empirical evidence from an ongoing research project on regional energy transitions. The framework then allows formulating hypotheses on different network dynamics. In a final step, we propose instruments from network analysis to empirically test these hypotheses and, thus, to verify our conceptual approach. This way, we provide a substantial contribution to both strands of research, the understanding of innovation network dynamics and the application of transition theory.

Keywords: network dynamics, transition theory, multilevel perspective, energy transition

Session 12: Social justice in the discourse of the German energy transition

Chairs: NEUKIRCH, Mario, FETTKE, Ulrike, University of Stuttgart, Germany

Within and beyond the German energy transition – key issues of social justice

NEUKIRCH, Mario, FETTKE, Ulrike
University of Stuttgart, Germany

Social justice is relative: It depends on the society we live in. In the political philosophy of the western democracies, the universality of human rights is a crucial benchmark for deciding what‘s right and what’s wrong. Against this background, our paper identifies two dimensions of social justice that are addressed during transitions to renewable and sustainable energy. On the one hand, there are global issues of social justice that are always present as to the terms of such a transition. Among the main global issues are: First, slowing down the climate change and reducing its catastrophic consequences that will harm primarily poor people in poor countries; Second, breaking the curse of resources like oil and gas that have been central reasons for armed conflicts, war and social polarization in most of these „rich“ countries; Third, making nuclear power use redundant. People working in the uranium mines and living near these sites have massive shortages of life expectation. Most victims of nuclear disasters are poor; Fourth, reducing regional contamination (e. g. emissions of mercury, plumb and fine dust). Often poor people live in areas where the air is strongly polluted and suffer negative effects on their health. From this point of view, the global energy transition is indispensable. On the other hand, we are looking at rather ambivalent and complex issues that may occur during energy transitions and that can only be evaluated with regard to the question of social justice by examining the concrete circumstances. These we will call contextual issues. Looking at Germany’s energy transition, the paper will discuss the following three key topics: Loss of jobs in the fossil-nuclear sector; The situation that many people living in rural areas feel that their quality of life decreased because new wind turbines or power lines were installed; Finally, the issue that renewable energies are said to be responsible for rising electricity prices what poor households cannot afford. Sometimes there are overlaps between subjectively perceived injustice of concerned people and powerful actors who seek to slow down or even stop the transition to serve their own interests. Since ambivalent issues like those mentioned here might be critical for the success of energy transitions on the national level, the paper calls upon inter- and transdisciplinary case studies in order to gain deeper insights with regard to social justice in these contexts.

Summary: Our paper identifies two dimensions of social justice that are addressed during transitions to renewable and sustainable energy. On the one hand, there are global issues of social justice that are always present as to the terms of such a transition. Among the main global issues are: Slowing down climate change; Breaking the curse of resources; Making nuclear power redundant; Reducing regional contamination. On the other hand, we are looking at rather

ambivalent and complex issues that may occur during energy transitions and that can only be evaluated with regard to the question of social justice by examining the concrete circumstances. These we will call contextual issues. Looking at Germany's energy transition, the paper will discuss the following three key topics: Loss of jobs in the fossil-nuclear sector; Possible injustices on the local level; Ricing prices for electricity prices.
Keywords: energy transition, social justice, power, sectoral change

Which justice for energy justice?

DÜBER, Dominik
University of Münster, Germany

At first glance, the demands of social justice in the field organizing energy systems appear to be contradictory. On the one hand, there seems to be a strong support of reasons derived from considerations of justice in favor of an energy system that relies on low-carbon sources. This is the case if we look from the perspective of justice between national states: especially those industrial states that benefit the most from greenhouse gas emissions should cover the costs of mitigating this development (polluter pays principle). This claim finds further support from the fact that these states are in a much better position to afford these measures and to deal with the consequences of climate change than those states of the global south that carry less responsibility and do not have the means to cope with the consequences of climate change (ought implies can principle). But from the perspective within the industrial national states, the findings seem to be the other way round: the costs caused by feed-in tariffs that guarantee profitable prices for producers of renewable electricity in the German energy transition are transmitted to consumers and place an over-proportional burden on lower income groups that have to pay a higher share or their income for satisfying their energy needs. This leads to the problem of fuel poverty. Those affected by fuel poverty therefore regularly demand to stop the energy transition because of the unjust burden it places on them.
Now, it seems highly unlikely that the same concept – social justice – can at the same time and in the same respect do both, support and refute the justification of the energy transition. If this would be the case, social justice itself would be an incoherent, self-contradictory concept that is unsuitable to guide real-world debates and decision making. But this conclusion is premature since even these short remarks hint at different conceptions of justice and different respects in which justice can come into play that are worth to be distinguished in order to get a more solid grasp of the different roles justice plays in the field of energy production and consumption.
The presentation aims at clarifying the role of considerations of justice in the realm of energy transition in two respects: First, it distinguishes the different justice-based arguments brought forward in debates on energy transition and tries to trace them back to different underlying (implicit) conceptions of justice. This step helps in getting a full-fledged account of the different respects of energy justice. Second, the presentation asks if the structure of the good in question – i.e. energy – demands a distinct account of justice. Is energy justice special in the

sense that it needs its own principles of justice? Or is it just a field of application for those principles of justice we think provide the best general theory of justice
– e.g. Rawlsianism, luck-egalitarism or the capabilties approach – and that are thought of being valid in all fields of societal organization?
Keywords: energy justice, social justice, energy transition, energy policy, climate change

Social justice in the ethical discourse on the German energy transition

KÖNIG, Andri
International Centre for Ethics in the Sciences and Humanities (IZEW), University of Tuebingen, Germany

Social justice is a classical and central topic of ethics. Today, ethicists often discuss social justice in the light of globalization as well as the consequences of our actions for future generations. Such discussions about global justice and justice between generations are closely linked to the principle of sustainable development. According to the Sustainable Development Goals of 2015, access to sustainable energy for all people as well as combating climate change are crucial to intra- and intergenerational justice.
Following the Fukushima Daiichi nuclear disaster in 2011, the German Bundestag decided – for the second time – to phase out nuclear power. The German "Energiewende" has ever since been upheld internationally as a primary example for a major economy transitioning its energy system to more sustainable alternatives. Hence, the "Energiewende" is usually understood as an exit of nuclear and fossil fuel energy as well as the rapid expansion of renewable energy technologies. These measures, while ostensibly questions of technological innovation, raise many ethical questions on a national as well as global level, including the question of social justice.
This is why the "Energiewende" has recently become an important subject for ethicists, especially those working in applied ethics. While some of the questions they discuss are relatively new, others have been considered previously in different contexts. For example, the risks of nuclear power and the unsettled question of final storage were well known and discussed by risk and technical ethics before 2011, not least due to the Chernobyl disaster in 1986. Furthermore, issues such as peak oil and anthropogenic climate change have long been a major concerns of environmental and sustainability ethics. More novel questions include 'Who is (financially) benefiting from the transition?', or 'To whom the transition means a disadvantage?'
This paper offers an overview of the ethical discourse on the German energy transition, focusing on questions of social justice. The main goal is to identify and name these questions as well as their spatial dimension – from the national to the global. In doing so, possibly neglected issues and inconsistencies will be highlighted and briefly discussed.
The paper has the following structure: Firstly, a short clarification of central terms ("Energiewende", social justice, sustainable development) will be carried out. Secondly, an overview of questions of social justice in the scientific ethical discourse on the German energy transition will be given. One result of this overview will be that questions of intra- and intergenerational

justice are rarely being discussed in depth. Thirdly, against this background, I will argue for a stronger integration of questions and theories of intra- and intergenerational justice (and hence, theories of sustainable development) to the ethical debate on the German energy transition.
Keywords: German energy transition, applied ethics, social justice, sustainable development, global and intergenerational justice

The greener the more gender-equal? Female representation and participation in the German energy transition

FRAUNE, Cornelia, KNODT, Michèle
Technische Universität Darmstadt, Germany

It is broadly accepted that the German Energy Transition has to comply with the three pillars of sustainability – sound economy, intact environment, and social justice – in order to establish an energy system that meets the requirements of an international competitive economy, prosperity, and social peace (Ethik-Kommission Sichere Energieversorgung 2011). Social justice seems to be achieved more or less by default by transforming the centralized and monopolist system of energy supply into a decentralized and competitive one that also enables ordinary citizens to be part of. In the face of free market economy and non-discrimination law, German energy policy seems to be gender-neutral. Rather, the impression is given that the German Energy Transition enhances gender equality since women are more concerned about the environment and prefer green energy technologies to a greater extent than men (Sundström and McCright 2014). In contrast, we will explore that the German Energy Transition is a process that is highly gendered and that it will reinforce structural gender inequality. We will provide evidence that women are underrepresented in both the public discourses about German energy policy as well as in renewable energy citizen participation schemes. We will argue that gendered analyses of energy transformation processes provide analytical insights into the social distribution of resources and power.

Ethik-Kommission Sichere Energieversorgung. 2011. Deutschlands Energiewende – Ein Gemeinschaftswerk für die Zukunft. Berlin. http://www.bmbf.de/pubRD/2011_05_30_abschlussbericht_ethikkomm
(Accessed May 27, 2015). Sundström, Aksel, and Aaron M. McCright. 2014. “Gender differences in environmental concern among Swedish citizens and politicians.” Environmental Politics: 1–14.

Keywords: energy transformation, representation, participation, gender

International cooperation and the transfer of knowledge as a means to counteract an absence of social justice in the realm of energy

MÜLLNERITSCH, Michael
Aracuba GmbH, Austria

An absence of social justice also manifests itself in the realm of energy, primarily as a deficiency in access to knowledge and education. Yet it is precisely this access that is the fundamental prerequisite for participating in related social discourse and the political process, as well as for recognizing personal opportunities related to energy transformation. This paper, based on the practical example of the "Aracuba Experts" networking platform, will demonstrate how technological- and transnational cooperation and knowledge transfer can reduce social injustices in the realm of energy. In particular, the involvement of interested youths from developing nations in this network of already-established and prospective future experts in the area of renewable energy will hereby be examined in greater detail. These young people thus obtain, for the first time, the opportunity not only to access the latest technologies and economic developments in this promising area, but also to engage themselves actively. It will be demonstrated how young people can further educate themselves and, in the sense of crowd sourcing and open innovation, actively integrate concepts into renewable energy projects and thus, themselves, aid in overcoming social injustice while, furthermore, sculpting their own futures positively.
Keywords: renewable energy, social justice, international cooperation and knowledge transfer, youth empowerment

Session 19: Social justice and conflicts in transitions to low-carbon energy systems

Chair: SCHREUER, Anna, Alpen-Adria Universität, Klagenfurt|Wien|Graz, Austria, IFZ – Inter-University Research Center for Technology, Work and Culture, Graz, Austria

Mission impossible? Implementing plus-energy standards in the social housing sector in Austria

ORNETZEDER, Michael, CAPARI, Leo
Austrian Academy of Sciences, Austria

The transition towards low-carbon energy systems implies radical transformations in the housing sector. In the near future all new buildings will have to meet close to zero energy standards and buildings increasingly will become sites of energy production. In addition, the existing building stock has to change dramatically, too. In the near future even the social housing sector has to meet advanced energy standards. This paper builds on an on-going smart city pilot project in the Austrian city of Korneuburg. The aim of the project is to develop, implement and monitor an integrated sustainable solution in the social housing sector. The project involves the refurbishment of two existing apartment blocks as well as the construction of a new building. The overall aim is to apply latest retrofit strategies and new construction techniques, including on-site energy production, ecological building materials and a green mobility concept. However, during the planning phase it became clear, that even under extremely favourable conditions it is very difficult to realize those high standards within the social housing context. Based on a number of qualitative interviews with relevant stakeholders we will show that this ambitious pilot project faces a number of non-technical problems. Of course, investment costs and financial restrictions are relevant, but economic factors provide only one explanation among others. The role of the municipality as building owner, the social meaning of the smart city concept, and the political status of vulnerable groups are of equal importance.
Keywords: smart city, energy transition, pilot project, implementation, barriers

Clean energy or extractive industry? A comparative study on the media representation of hydroelectricity in Colombia and Guatemala

PONCIANO, Renato G. (1), NERESINI, Federico (2), TUZZI, Arjuna (2)
(1) University of Padua - Universidad de San Carlos de Guatemala, (2) University of Padua, Italy

As part of a project studying the conflicts around the hydroelectricity expansion (Orantes, 2010) in Guatemala, it was performed a software-assisted content analysis of opinion articles in news media in Guatemala and Colombia, as described by Neresini & Lorenzet (2014). The

comparison was made to determine whether the representation of hydroelectricity in Guatemalan media was similar to those in Colombia or whether there were some significant differences. Colombia was chosen since it has roughly the same type of environmental conflicts as Guatemala (Lea, Del Bene, & Martínez-Alier, 2015) and because both countries have similarities (colonial past, language, indigenous population), but there are enough historical, social and political differences between them to make the comparison worthy. Only media with a web presence were selected for the analysis. Those with the largest amount of web traffic in each country, according the statistics site alexa.com, were selected, resulting in ten websites in Guatemala and 16 in Colombia. The opinion articles were selected from each site using a relevant keyword search, and limiting the result to the 2010-2015 period. Then their content was extracted using data mining software, resulting in 262 articles from Guatemala, and 303 from Colombia, for a total of 565 articles. The content of the articles was analyzed with statistical techniques that use the bag-of-words approaches (Tuzzi, 2010) and the assistance of content analysis software QDAMiner© and RapidMiner© . Specifically, correspondence analysis showed that there were significant differences in the media representation of hydroelectricity of each country. Words like “rights”, “population”, “social”, “safety” and “life” are more strongly associated with Guatemala, while “generation”, “production”, “process”, “energy” and “millions”, with Colombia. Analyses by phrases and topics gave similar outcomes. These results suggest a view more centered in conflict and the social consequences of hydroelectricity in Guatemala, while in Colombia the debate is more focused on hydroelectricity as a national development project.

References:

Lea, T., Del Bene, D., & Martínez-Alier, J. (2015). Mapping the frontiers and front lines of global environmental justice: the EJAtlas. Journal of Political Ecology(22), 255-278. Neresini, F., & Lorenzet, A. (2014). Can media monitoring be a proxy for public opinion about technoscientific controversies? Public undestanding of science, Published on-line first. Orantes, P. (2010). Comprendiendo la conflictividad por hidroeléctricas en Guatemala: Para tender puentes de gobernabilidad. Guatemala: IRALEP - Embajada de los Países Bajos. Tuzzi, A. (2010). What to put in the bag? Comparing and contrasting procedures for text clustering. Statistica Applicata-Italian Journal of Applied Statistics, 22(1), 81-97.

Summary: A comparative study, using software-assisted content analysis, of a corpus of opinion articles in Guatemala and Colombia on the subject of hydroelectricity and its conflicts, shows that in Guatemala, hydropower is more associated with social issues and conflict, while in Colombia with development.

Keywords: hydroelectricity, environmental conflicts, energy transitions, Guatemala, content analysis

The spatial and social adjustmentof cities and the questions of spatial justice in the low-carbon energy transition

SPOSITO, Sabrina

Institute for Advanced Studies on Science, Technology and Society (IAS-STS), Austria

In the contemporary civilization, the damaging actions on cities, nature, and landscapes have dramatically augmented according to increasing wasting processes through which places and materials are subject to consumption, deterioration, and finally rejection. This phenomenon is permeating. It exists at such an extent that its various implications involve the society as a whole. In substance, it designs a vast setting of depleted lands that Lynch and Berger have legitimated as unavoidable by-products of societal and technological transformations in needs of systemic and landscape reinterpretations.

In time of climate and demographic changes, recovering those areas affected by dismissal, under-use, or pollution is extremely relevant and urgent. Against this background, in the sphere of urbanism and the urban design disciplines, important studies and projects made and are making meaningful progress on this topic enriched by the ecological studies, the diagrammatic energetic models, and the new interpretative lexicon deriving from landscape ecology. Nevertheless, there is still relevant space for discussion and experimentation, especially concerning the mechanisms and dialectics that link urbanisation and natural assets (water, soil, energy) in light of the resource and economic shortages.

Within the science, technology, and society framework, the author focuses on the spatial and social adjustment of cities and the questions of spatial justice in strong connection with the low-carbon energy transition. In particular, the investigation concerns the conversion of a number of abandoned, neglected and/or polluted spaces to localize renewable energy infrastructures, technologies, and systems: the spatial consequences of decarbonisation, the integration with landscape approaches, the connections with wider regeneration strategies, the implications on the governance structures, etc. The study is based on the east side of Naples (Italy), a post-industrial site in the heart of the city threatened by contamination, urban decline, and inequality.

Keywords: decarbonisation, depleted lands, urban metabolism, spatial justice, east side of Naples

Protests against the extension of the German electricity grid. The rise of a social movement?

NEUKIRCH, Mario
University of Stuttgart, Germany

There have always been conflicts over large infrastructure projects. But in most cases citizens' protests have been limited to certain local hotspots. In contrast, the extension of Germany's electricity grid takes place in the whole country and the number of conflicts is rising, because more and more projects are reaching advanced planning-states. To a large extent, the conflicts have been driven by local concerns. In spite of environment groups have tried to broaden the dominant frames among the protest actors, the larger share of the initiatives continued their activities as single organizations without or only loose connections to other groups. A few years ago, the planning of large HVDC power lines started („Electricity Highways"). Even stronger protests arose against these projects. But this opposition not only grew in terms of quantity compared to existing power line conflicts. Moreover, it is more radical, demanding to build the power lines not at all. Still, many protest initiatives came from local contexts. But, they have become part of large umbrella organisations that support the local groups by providing organizational assistance, orientation and making the key demands more visible for legislators at different policy levels and the general public. Against this background of the conflict's transformation, the proposed paper deals with the question, in how far the grid extension protests have turned into a social movement.

Summary: After the planning start of large HVDC power lines („Electricity Highways") in Germany, the protest aganinst the extension of the electricity grid – that former displayed rather localist orientations – now has become more radical. Against this background of the conflict's transformation, the proposed paper deals with the question, in how far the grid extension protests have turned into a social movement.

Keywords: social movements, electricity grid extension, energy transition, large infrastructures

STREAM: Digital STS Discourses

Session 13: The webvideo in science communication: issues and trends

Chairs: GEIPEL, Andrea, Munich Center for Technology in Society, Technical University Munich, Germany, STENGLER, Erik, University of West of England, Bristol, United Kingdom

Gender Questions on YouTube. Depictions, Misconceptions and Ideological Bubbles

CZURDA, Klemens, MUÑOZ MORCILLO, Jesús

ZAK | Centre for Cultural and General Studies at the Karlsruhe Institute of Technology, Germany

Our paper analyzes depictions of gender topics on five extreme popular YouTube web videos with focus on misconceptions, shortcomings and ideological bubbles that probably shape the opinion of millions of people. The current research on science communication on YouTube addresses crucial questions such as popularity, typological descriptions, accuracy of the content or commodification aspects among other things. However, the majority of the research issues concerns the communication of STEM disciplines ignoring that other disciplines such as social sciences and humanities, are present in millions of YouTube videos. Therefore, we chose the depiction of gender in five major YouTube videos as subject of investigation since this is a crucial societal topic. Indeed, different conceptions of gender are supposed to be very influential in western society although with strong controversies related to the social and biological construction of it. The present paper brings to the fore some shortcomings and limitations of five major YouTube science communicators and discuss possible direct and indirect motivations by taking into account results of recent research on the YouTube production context.

Keywords: gender, web video, filter bubble, commodification, digital divide

Framing climate change on the webvideos

AZEVEDO, Jose
Porto University, Portugal

Contemporary societies take science seriously. Media widely covered debates about themes based in science knowledge. They presume that science can resolve disputes over factual issues such as the question of whether vaccines can cause autism, whether climate change is a reality, whether nanotechnologies are safe. Such disputes are, however, not purely "scientific", they are formed around and structured by complex social interests. A better understanding of the interplay between knowledge-directed and value- or politically directed forces in scientific controversies can be regarded as prerequisites for reducing the distance and tensions between science and society. The rise in reaction against a scientific technology appears to coincide with a rise in quantity of media coverage, suggesting that media attention tends to elicit a conservative public bias. As most people have limited resources to assess the accuracy of the data on global climate change and have yet to feel its effects directly, their scientific perceptions are likely to be swayed by framing or messaging strategies (Hart and Nisbet, 2012; Jang, 2013; Rickard et al., 2014). Acknowledging the significance of media framing in climate change contexts, several studies have examined the ways in which mass media interpret global climate problems in terms of definitions, causes and remedies (Boykoff and Boyokff, 2004; Hart and Feldman, 2014). In the contemporary media landscape the online news and particularly the web videos gain particularly importance. In this paper we report the content analysis of 300 online videos selected through Google, as a result of entering the search term "climate change". The study focuses on the dominant narrative frame in each video. The characterization of each frame is discussed in relation to other content categories used (authorship, objectives, theme).

Keywords: framing, science communication; climate change; webvideos

'Don't act like a teacher'. On the importance of authenticity for science communication on YouTube

GEIPEL, Andrea
Munich Center for Technology in Society, Technical University Munich, Germany

"Remember, stay true and make what you love." With this statement, the YouTube Creator Academy wants to help new users of the platform to start their own YouTube channel and therefore emphasizes the importance of 'being authentic' to become a successful creator. This high relevance of 'authenticity' for creating content seems to be a common concept. However, the question arises: What does it mean to 'be authentic'? Using the example of five 'Science Cannels' my talk will focus on the performance of authenticity on YouTube, how this concept is constructed and how it influences the image of science communication. Based on qualitative interviews, video analysis and ethnographic methods I will look behind the concept of 'authenticity' and ask for the specific expertise YouTube as a platform affords. While it is true that everybody can upload video content, the platform logic privileges certain types of videos produced by users with knowledge about the platform's technical, algorithmic, and social

conditions. As a result, videos produced by a new class of experts are more likely to be distributed, advertised and therefore seen by other users. This new platform specific expertise derives from the transformation of three dimensions: dealing with gatekeepers, building networks, and performing authenticity. Considering the interplay of all three dimensions negotiating a videos visibility, it seems that the importance of 'authenticity' is highly overrated – especially in the case of science communication.
Keywords: authenticity, expertise, science communication, video platform, YouTube

Using animation to communicate earth science and sustainability

KERLOW, Isaac
Earth Observatory of Singapore, Singapore

Moving images are a powerful medium for analyzing, exploring and visually communicating complex concepts, and they are also the premiere medium for contemporary storytelling. Animation can have multiple roles in science communication today but it is particularly effective for explaining complex concepts and also for creating emotional connections with mainstream audiences. On a practical level animation can be free from the production constraints and the expense of live action filming. This presentation shows and explains a variety of animated sequences produced by the Art+Media Research Group at the Earth Observatory of Singapore. These animations have been used to communicate Earth science and sustainability in a variety of interdisciplinary projects. The projects reviewed range from scientific documentaries, to narrative shorts and interactive games. http://art-science- media.com/
Summary: This presentation shows and explains a variety of online animated sequences used to communicate Earth science and sustainability.
Keywords: science communication, animation, webvideo, production, storytelling

Webvideos on topics of food intolerance

BAUER, Stefanie (1), ALLGAIER, Joachim (2), JUNGWIRTH, Helmut **(1)**
(1) Karl-Franzens-Universität Graz, Austria, (2) Alpen-Adria-Universität, Austria

Many people suffer from food intolerances and allergical reactions to food. The scientific community is somewhat ambivalent whether food intolerance problems are a serious threat to health and many members of the public are unsettled about how to get useful and helpful information. In addition, much of the information about food and food intolerance on the web is biased, for instance for commercial reasons. In our research project we were interested in how members of the public inform themselves on the Internet about this topic. Therefore, we have conducted various types of surveys among citizens in Styria and Carinthia in order to find out which internet sources they used for information purposes. Here, we have been especially interested in citizens' views and possible examples of webvideo formats about topics of food intolerance that they found useful and helpful. In this presentation we are going to present the results and discuss some illustrative examples of webvideos that were recommended by the questioned citizens.
Keywords: food intolerance, public reception, webvideo, YouTube, internet

Session 14: Digitalized industry and social emancipation

Chairs: MEYER, Uli, SCHAUPP, Simon, SEIBT, David, Technical University Munich, Germany

Emancipation through digitalization? The case of 3D printing in the prosthetics industry

SEIBT, David
Wuppertal Institute, Germany

"Power through design", could be the mantra of User Studies in STS (Woolgar 1991; Akrich 1992; Oudshoorn/Pinch 2003; Hyysalo 2016). The basic idea is that designers inscribe into their products a certain idea of the user, her context and what s/he is supposed to do with the thing. Even though such inscriptions can be ignored, resisted or changed, they do to some degree contribute to shaping who the product's users are going to be and what they are go-ing to do. If this is so, there should be a way to change these power-relations through re-configuring design practices (Suchman 2007, 2012) and this is exactly the promise connect- ed to many digital fabrication technologies: "emancipation through design". I will critically examine this claim for the case of 3D printing in the prosthetics industry. My talk will focus on three ways digital fabrication re-configures how users of prostheses are constructed, and how these offer very different versions of "empowerment". Firstly, I will fo-cus on the topic of digital mass customization, which promises a more accurate representa-tion of the user. Producing individualized products on an industrial scale is supposed to fur-ther improve the fit between the product and its user both functionally and aesthetical-ly. Secondly, digital fabrication in prosthetics is picked up by open source communities, promising to make the design process itself accessible to underserved users and empower them to produce their own limbs. Thirdly, many of the prostheses designed for 3D printing differ from traditional devices in that they cast the user not as disabled, but as enhanced. Designs alluding to Disney characters or Marvel comics, thus promise to overcome en-grained norms connected to users and their bodies.

References: Akrich, Madeleine (1992): The De-Scription of Technical Objects. In: Wiebe E. Bijker und John Law (Hg.): Shaping technology/building society. Studies in sociotechnical change. Cambridge, Mass.: MIT Press (Inside technology), S. 205–224. Hyysalo, Sampsa; Jensen, Torben Elgaard; Oudshoorn, Nelly (Hg.) (2016): New Production of Users: Taylor and Francis. Oudshoorn, Nelly; Pinch, Trevor (Hg.) (2003): How users matter. The co-construction of users and technologies. Cambridge, Mass.: MIT Press (Inside technology). Suchman, Lucy (2007): Human-machine reconfigurations. Plans and situated actions. 2nd ed. Cam-bridge, New York: Cambridge University Press. Suchman, Lucy (2012): Configuration. In: Celia Lury und Nina Wakeford (Hg.): Inventive methods. The happening of the social. London, New York: Routledge (Culture, economy, and the social), S. 48–60. Woolgar, Steve (1991): Configuring the user. The case of usability trials. In: John Law (Hg.): A Sociol-ogy of monsters. Essays on power, technology, and domination. London, New York: Routledge
(Sociological review monograph, 38), S. 57–103.

Keywords: user studies, re-configuration, design, 3D printing, prosthetics

Emancipatory infrastructure in shared machine shops down the line?

BOEVA, Yana
Science & Technology Studies, York University, Canada

Digital fabrication technologies and the recent practices of making have been hailed for their empowering and emancipatory capacities of reconfiguring categories like production and design, work and leisure, professional and amateur, and of dissolving the boundaries between them. Prior research on digital fabrication and making has connected the idea of social emancipation of these technologies and practices through a range of different subject matter. Studies have included core motivations for making and self-definitions of the practices (Buechley et al. 2012; Philips et al. 2013), the central idea of user empowerment (Tanenbaum et al. 2013; Ratto & Boler 2013); the connection between making and user innovation and technology production (Lindtner 2015; Powell 2012), or descriptions of maker communities as 'expert amateurs' (Kuznetsov & Paulos 2010). One specific and grounding perspective to look at those topics around the idea of social emancipation is to study the sites of interaction, that is the "shared machine shop" as the common denominator for the different types of spaces (Hess 1979; Troxler & maxigas, 2014). Following this perspective, then, this paper asks broadly how is emancipation translated into a shared machine shop. Specifically, the focus is on three structural aspects that have emerged throughout my ongoing empirical research of shared machine shops with an emphasis on design work. First, while maker practices are popularized particularly through their connection to leisure, increasingly shared machine shops put an emphasis on goals situated in the context of work and professionalization. A second aspect looks at the exposure of financial arrangements, the governance of a space, and a growing trend to quite invisible corporate partnerships. Lastly, within the past few years there has been a growth of associations and professional networks aimed to provide support and guidance for shared machine shops and their professional members. These aspects are closely connected and reveal that the idea of social emancipation of digital fabrication and making conveys frictions as is the case, for example, within my study of spaces catering facilities to professionals, but promoting openness and inclusiveness for everyone. Drawing on in-depth interviews with various players—members, owners, advocates—involved in these shared machine shops and organizations across Europe and North America, I unpack these aspects following Star and Ruhleder's concept of infrastructure as a concept "in relation to organized practices" (1996). The paper argues that a proclaimed de-professionalization of design and production on account of the invention of new forms of expertise and identities with digital fabrication and making is overthrown as legacies of traditional categories and forms of organization invisibly shape its development.

Keywords: digital fabrication, infrastructure, design, professional

Automation and making: concrete utopias of digitalisation compared

FREY, Philipp, SCHNEIDER, Christoph
Institut für Technikfolgenabschätzung und Systemanalyse, Germany

We want to turn towards two major ideas of emancipation through digitalisation that have gained (renewed) prominence during the past years: the emancipation from socially necessary labour due to automation on the one hand and the self-determination of creative work due to highly adaptable and decentralised technology on the other hand. The former concept is currently being presented by progressive commentators - such as Aaron Bastani, Peter Frase, Alex Williams and Nick Srnicek - in light of the accelerating wave of automation both in and beyond industry. The latter idea has been taken up particularly in the 'maker movement' where individualised and accessible forms of digital fabrication are experimented with. In our paper we will compare these ideas and trace their contours historically. However, we are especially interested in their recent uptake in fields of practice and in their potentials for emancipatory societal change. We will therefore analyse these ideas as 'concrete utopias' (Ernst Bloch), utopian visions which are mediated with present societal tendencies of development. Instead of just focusing on abstract ideas and discourses we are interested in learning how these ideas are embedded in social context and practices and how particular actors combine 'theory' and 'practice' to push the realm of societal possibilities towards emancipatory goals. We will carve out the emancipatory dimensions of the utopian discourses in the maker and the pro-automation movement (if it can already be considered to exist). Furthermore, we will comparatively analyse the subjects of these socio-technological innovation processes as well as their practices. At the same time, we will touch upon the questions whether technology can be considered a neutral vehicle of societal development and whether these emancipatory concepts themselves are at risk to degenerate (e.g. if the increase of productivity is prioritised over the human satisfaction of needs, or when the verve of the maker movement serves as a rejuvenating treatment for capital accumulation). This will help us highlight similarities and differences concerning the relationships between subjects and digital technology as well as conceptions of change inherent in these practices. By this way of analysis we will also show that there exists no abstract, transhistoric 'purity' of these ideas nor of the agents and their practices that we consider to be pushing the possible. Rather, the uptake of these ideas, whose roots date back to the 19th century, takes place in contested and messy fields of practice with divergent interests and complex (power) dynamics involved. Precisely because of this, the focus of 'concrete utopias' on ongoing, imperfect and problematic forms of experimentation in a dynamic and unfolding present enables us to trace emancipatory potentials without romanticising or idealising the realities of social development. Rather, we will argue that precisely in the opaque fields of practice there lies potential for novelty that might not yet be expressed in discursive ideas. Through our analysis we propose a scheme for the analysis of concrete utopias, developing Bloch's theoretical framework further.

Keywords: digitalization, emancipation, utopian thinking, maker movement, automation

Alternatives to cybernetic capitalism

SCHAUPP, Simon
MCTS – Munich Center for Technology in Society,
Technical University of Munich, Germany

Self-tracking apps allow for a flexible economically rational self-optimization, factories are steered by self-learning algorithms and the police tries to predict crimes via big-data analytics: Cybernetic principles of feedback-based systems play an ever more important role for capital accumulation and control in highly technologized capitalist societies today. However, this paper aims to demonstrate that the implementation of cybernetic control does not necessarily imply cybernetic capitalism. It reconstructs a forgotten history of non-capitalist cybernetics, from Norbert Wiener´s trade unionism and Grey Walter´s cybernetic anarchism to Stafford Beer´s project Cybersyn in socialist Chile. I will continue by shortly sketching current alternative cybernetic experiments. From these examples, I try to extrapolate the ambivalence of the cybernetic onto-epistemology regarding social emancipation, understood as radical democratization.
Keywords: cybernetics, capitalism, self-organization, control

Open source software: from niche to mainstream

SCHRAPE, Jan-Felix
University of Stuttgart, Social Sciences, Germany

The term open, used in phrases from “open access” to “open science” and “open innovation,” has become part of the standard vocabulary in modern society. Today, projects of all kinds flaunt the attribute of openness and its associated promise of more decentralized and democratic organizational or coordination structures.

An important starting point for the popularity of the openness paradigm is the rapidly increasing relevance of open source projects in software development since the turn of the millennium. In the social sciences, accustomed to regarding intellectual property rights as drivers of innovation processes, that increase was initially received with surprise. However, not long thereafter open source became acknowledged as an emerging production model that is based on voluntary collaboration among equals and that could break with established forms of socio-economic coordination, such as the market or hierarchy. In that context, the concept of “commons-based peer production” gained traction. Hailed as a technically- induced “collaboration among large groups of individuals [...] without relying on either market pricing or managerial hierarchies to coordinate their common enterprise” (Benkler & Nissenbaum 2006: 381), the concept was to be accompanied with “systematic advantages [...] in identifying and allocating human capital” (Benkler 2002: 381) and has been increasingly applied in adjacent fields, such as the production of material goods (“maker culture”) or the service sector (e.g., Rifkin 2014).

However, observations of open source projects have shown that the growth of the developer communities goes hand in hand with the formation of distinct hierarchical decision-making patterns; that leading IT companies are gaining considerable influence over important projects;

and that firmly established projects are not run by intrinsically motivated volun- teers—"satisfying psychological needs, pleasure, and a sense of social belonging" (Benkler 2004: 1110)—but are based on the contributions of employed developers. For example, in the Linux kernel project, often referred to as a typical open source project, more than 85 percent of the commits were made by programmers who "are being paid for their work" (Corbet & Kroah-Hartman 2016: 12). In light of this, the oft-made claim that open source communities are radical subversive alternatives to proprietary development are essentially blanket statements that do not hold. This raises the question of which of these projects might actually live up to the "promises of openness, freedom, and democracy" (Kranich & Schement 2008: 563).
Against this backdrop, my presentation will work out a systematic overview of the institutionalization of open source projects as an integral part of the global software industry from a technical- and organizational-sociological perspective (Schrape 2016):
• I begin with a historical reconstruction of the genesis of open source software projects and their changing relationships to established IT companies.
• This is followed by the identification of four typical variants of current open source projects, namely, corporate collaboration projects, elite-centric communities, heterar- chical infrastructure projects and egalitarian groups.
• I then examine why open source software projects have largely lost their potential as an emancipatory alternative to commercial production while nevertheless representing a socio-technically stabilized form of collective invention. That followed, I assess the broader societal implications of the developments under discussion.
Keywords: open source, innovation, peer production, software industry, democratization

Data from and for work

LEMM, Jacqueline, STRUEVER, Niklas
Institut für Soziologie der RWTH Aachen University, Germany

Digitalisation as an accelerating process has become a constant factor of our mundane life and hence has proliferated in the flied of work as well. Acknowledging the progress of the
"Industrie 4.0" and the simultaneously progressing datafication, it is of the essence to realise the analytical potential and the possible ameliorations for our socio-technical working day. Co-evoluting, technical assistance systems are being invented, which open up a world of data driven analysis in order to change our work process. In a modern world of employment everything can be translated into data. Due to this omnipresence and importance of data an analytical tool is necessary to help understand and outline organisational structures. Especially when talking about the distribution of the accumulating data there are two possible scenarios that can be displayed by such a tool:

• On the one hand given data could lead into a reinforced oppression of the workforce by the higher level of hierarchy of enterprises

• On the other hand there could be a possible emancipation of the work force enabled by total transparency through data

The first possibility could be summarised as a resurgence of working conditions similar to the conditions in place during the industrial revolution.
The second possibility might lead into a semblance of domination-free discourse that could eventually improve all labouring conditions.
Driven by this idea we propose a model of five analytical moments referring to Flyverbom and Madsen (2015) which sorts out data as follows:
The production of data: At this stage there is a differentiation between “source” and
“meta” data. When any machine is used there is an amalgamation of data that can be derived from the source. It is during this process that metadata is derived as a byproduct. With metadata we can deduct traits of the process that is spawning the metadata.
The structuring of data: The structuring of data can be described as the evaluation of the data, accumulated in phase one, through algorithms, recognizing patterns and hence optimising the process.
The Distribution of data: This phase carries the most importance in our opinion, since distribution can heavily influence to what extend the data can be used, and especially by whom. We differentiate between ex- or including data that can be accessed by the different levels of hierarchy and thus be used to control the workflow.
The visualisation of data: Intertwined with the previous moment the visualisation of data is key for ex- or including co-workers into the organisational proceedings. Here workers could be either withheld information or be supplied with organisational knowledge benefiting to their work.
Control through data: All accumulating data and its analytical results strive to insert a way of control, which in the context of work could often be paraphrased as process optimisation.
Summary: All in all the datafication can be accurately described by the presented model of five analytical moments. By focusing on the distribution of data a potential of power and control can be outlined. It is to be assumed that this potential is imprinted into the technical artefacts and thus those artefacts become the facilitator of new courses of actions, whatever those might be.
Keywords: datafication, work, digitalisation

STREAM: Responsible Research and Innovation (RRI)

Session 15: RRI: How to move on from concept to real change?

Chairs: BAJMOCY, Zoltan, University of Szeged, Hungary & IAS STS Graz, THALER, Anita, WICHER, Magdalena, IFZ - Inter-University Research Centre for Technology, Work and Culture, Austria

NewHoRRIzon: taking RRI from vision to pragmatism

SCHOISSWOHL, Ulrich (1), GRIESSLER, Erich **(2),** SCHRAMMEL, Maria **(3)**

(1) FFG - Austrian Research Promotion Agency, Austria, (2) IHS – Institute for Advanced Studies, Austria, (3) ZSI – Centre for Social Innovation, Austria

Responsible Research and Innovation (RRI) is rapidly evolving as an academic concept, yet it is still little recognized outside the narrow circle of academic peers of STS and innovation studies. Understanding of RRI amongst policy makers and scientists not involved in its development, however, doesn't come easy. To these actors the concept seems far too abstract to be accessible and its application to a concrete research or innovation process is far from obvious. In our paper we argue that this does not come as a surprise: Like ethics RRI cannot be simply imitated or reproduced it needs to be lived, applied and practiced to be understood. Like in ethics RRIs very nature is of that sort that it becomes stable and its implications clear once it is applied to a concrete research or innovation process while it remains fuzzy and ambiguous as long as it is discussed without a particular application in mind. This makes RRI a practice to be incorporated not a set of information to be reproduced. Lingering in purely theoretical discussion will only take RRI so far while it increases the likelihood of RRI becoming contested before it can even start to trigger a significant change in the practice of research and innovation. On the pragmatic side what is needed to trigger such a change is a heightened awareness for issues of RRI amongst a critical mass of the key actors involved in the global innovation systems as well as an understanding how a shift towards RRI would affect their day-to-day practice. To get there we need to engage them in RRI: The authors are strongly convinced that RRI is not a zero-sum game. We are convinced that key actors need not be persuaded of RRI. They only need to be shown, assured and given sufficient space and time to voice their concerns and integrate the idea by first hand experimentation. What is needed are spaces with the potential to initiate such a change in awareness where it can be understood that RRI is not an idealist's vision but a strategist's pragmatism. The HORIZON 2020 project "NewHoRRIzon" aims at working out the conceptual and operational basis for a stronger integration of RRI into European and national research and innovation practice and funding. In NewHoRRIzon we are going to experiment with providing spaces where a change in awareness and practice like it is intended by RRI can be initiated. Theses spaces will be called Social Labs. We are going to establish 18 Social Labs

and install a RRI Agency Network following an approach very similar to the Social Lab approach described Zaid Hassan [Zaid Hassan, 2014. The Social Labs Revolution: A New Approach to Solving Our Most Complex Challenges. Berrett-Koehler Publishers, Inc. San Francisco, USA]. These Labs will act as multi-stakeholder quasi-organisations tasked with developing the conceptual and operational basis mentioned above while at the same time taking RRI outside the Lab by generating a continuous stream of activities, instruments, interventions and other innovations fostering a stronger awareness and understanding of RRI amongst a broad range of actors.

Keywords: RRI (Responsible Research and Innovation), theory-to-action-gap, social labs, HORIZON 2020, change

RRI from an activist's perspective

WHEATLEY, Tracey

Transition Wekerle & Protect the Future Society, Hungary

The presentation addresses the opportunities and pitfalls of cooperative research from the perspective of a civil activist. Our community has long been concerned with bringing about "real change" on the ground. During this endeavour we have established cooperation with researchers, taken part in cooperative research projects on social innovation and in science shop initiatives. A recent cooperation takes place as part of an H2020 project (FoTRRIS), which focuses on responsible research and innovation (RRI). This provides an opportunity to reflect on what RRI could offer for those initiating change "in the field" (as scientists call it).

Keywords: social activism, RRI

RRI principles put into practice: Participatory action research with the Roma Community in Hungary

BAJMOCY, Zoltan

University of Szeged, Hungary & IAS-STS Graz, Austria

The concept of responsible research and innovation (RRI) stresses that tackling grand societal challenges requires collective (shared and mutual) responsibility. However, the principles of RRI, such as anticipation, reflexivity, responsiveness and inclusion leave room for various interpretations. Taking responsibility in complex, uncertain and unstructured real-life situations raises a number of dilemmas – both theoretically and practically. Present paper introduces an action research process with the local Roma Community in Szeged, Hungary. While participatory action research (PAR) is often referred to as a way for translating RRI into practice, the idea of PAR emerged and has been spreading independently of the RRI concept. Nevertheless the PAR literature puts a lot of emphasis on discussing ethical principles and project requirements; something RRI could benefit from.

In this paper we focus on an element of our PAR process: a social innovation (called patronage

programme), which seeks for a meaningful way in tackling extreme poverty. The programme attempts to directly connect middle class patrons to Roma families or children and induce a patronage process that goes way beyond financial assistance. We use the case to raise dilemmas about the concept and principles of RRI when turned into practice.

Keywords: RRI, principles of RRI, participatory action research

Community, matter of care, and being useful: re-narrating RRI with the voice of all-russian multiple sclerosis society

ENDALTSEVA, Alexandra

École des hautes études en sciences sociales (EHESS), France, Linköping University, Sweden

Despite its direction towards public engagement, open innovation, mutual responsiveness of stakeholders, etc., RRI emerged as a hero in a bounded circle of European policy narratives (von Schomberg, 2013). Moreover, despite the development and activation of Anthropocene, Capitalocene, and other concepts in STS, responsible research and responsible innovation, along with open science concepts are still tailored towards not just developed worlds, but developed and with-access-to-resources layers of the developed worlds. The worlds which can claim the role of “engagers” of the “publics”. This RRI hero shines brighter in the places where the armour is polished year by year by national and international support schemes; in other situations, however, it changes the mask onto Servantes’ embodiment of a rational person (in the best scenarios). What happens when this hero is situated in a vulnerable,
unknown, and silenced context?

Being shaped with Puig de la Bellacasa’s (2011) concept of “matter of care”, this presentation is inspired by the experiences of a researcher, researched situation, information sources, and stakeholders working together in staging events and communicating health-related matters of care in contemporary Russia. It tells a story of creative “laymen” hacking the system, shared care as innovation driver, and invisible RRI work directed at the situation here and now. It connects these experiences with the prognoses of innovation potential of the “4th sector”, presented at the conference on public engagement held in Brussels in 2016, and with the post-colonial discourses.

This presentation appeared “from the insides” of a larger ethnographically-focused research project on the dynamics of knowledge work, communication, and action in All-Russian Multiple Sclerosis Society (ARuMSs). This presentation aims to re-narrate the concept of RRI viewed through the lens of community of people united and empowered by sharing the same disease and disability. By critically analyzing discussions of ethnographic field notes and analytic conclusions between a researcher and “research objects” and illustrating emerging concepts with “top-down” innovative actions, this presentation presents a discrepancy between the image of innovation appearing in policy documents and the experiences of innovation created and invisibly worked out in local communities. Finally, this presentation shares the “hack tips” of ARuMSs on how to implement RRI in-the-action as well as constraints of the situation and the ways to negotiate them.

References: Puig de la Bellacasa, M. (2011). Matters of care in technoscience: assembling neglected things, Social Studies of Science, 41(1), pp 85–106.
von Schomberg, R. (2013) A Vision of Responsible Research and Innovation, in Responsible Innovation: Managing the Responsible Emergence of Science and Innovation in Society (eds R. Owen, J. Bessant and M. Heintz), John Wiley & Sons, Ltd, Chichester, UK. doi: 10.1002/9781118551424.ch3
Keywords: patient community, Russia, non-colonial RRI, matter of care, hacking

Session 16: How can Responsible Research and Innovation (RRI) support social justice?

Chairs: DALLAMAGGIORE, Eve, LGI Consulting, Germany,
KARNER, Sandra, IFZ Graz, Austria

Research and social justice in the energy transition: how scientists working on renewable energy technologies perceive their role in society

JUNQUEIRA, Luis
Institute of Social Sciences - University of Lisbon, Portugal

The transition from fossil fuel based energy production to sustainable alternatives is a key challenge in contemporary societies. Research plays a vital part in that transition effort as the ability to foster renewable energy adoption is dependent on the development of more efficient and less expensive technology. Over the last few decades the European Union increasingly promoted sustainable energy as an essential part of its Framework Programmes (and more recently as one of six key societal goals in the Horizon 2020 Programme) leading to a consolidation of research communities working renewable energy technologies and related fields of research. Science-society relations take a particular shape when they involve a subject as prominent in contemporary societies as renewable energies. They are integral part of an ongoing sociotechnical transition that is both tied to powerful private interests and to public concerns frequently discussed within civil society and the media. In this context scientists' engagement with society is embedded in a broader political discussion about what collective path should be taken to address climate change and who should bear the costs (financial, social, environmental) of the transition. Not only is science tied to the usual narrative of scientific production as a public good and source of socioeconomic prosperity but also packaged with specific and controversial political goals such as the need of counteracting climate change and national energy dependence using sustainable and endogenous energy sources as alternative for fossil fuel sources. This presentation aims to understand how scientists working in renewable energies perceive the role of science and of their field in a society engaged in a profound

energy transition. Firstly, by exploring how they perceive their role as experts. Does this role entail a commitment to social justice? In what way? Secondly, by exploring how they perceive the current and future societal impact of renewable energy technologies. How determinant is technology in shaping social and environmental justice? Do social and environmental goals have a part in defining research objective for institutions and research teams? This presentation will try to address this questions drawing on semi-directed interviews with Portuguese researchers working on a range of different renewable energies technologies. This presentation is based on the work developed for the PhD programme in Sociology, in progress at the Institute of Social Sciences, University of Lisbon and funded by the Foundation for Science and Technology (FCT).
Keywords: renewable energy technologies, energy transition, social justice, perceptions, researchers

Design of just social systems: benefits of a co-RRI approach

DALLAMAGGIORE, Eve
LGI Consulting, Germany

While social justice can be identified as a property of social systems, defining it is still a matter of debate (Jost and Kay, 2010). Three aspects of social justice can be distinguished: distributive (distribution of societal outputs among all societal actors), procedural (ethical rules governing decision-making) and interactional (human considerations of, and between, societal actors). If the 'what' question leaves room for further definition, the 'how' question equally requires further consideration: there is not yet a clear way to get to 'socially just' social systems. We propose the Co-RRI approach as a relevant and important lever to the design of such systems; in particular, it addresses the distributive and procedural aspects of social justice. The Co-RRI approach, COmmunity-oriented Responsible Research and Innovation, is developed as a singular approach to RRI (Responsible Research and Innovation) by the FoTRRIS project. RRI, adopted as a concept driving R&I activities at the EU level, has developed in order to allow incumbent R&I systems to face the grand societal challenges, including social justice issues. In the Co-RRI approach these grand societal challenges are considered as systemic, negative externalities, of current socio-economic systems, which economic growth has been importantly fuelled by R&I activities. The causes of these externalities are the design of the socio-economic system, where value is mainly defined as monetary, and associated assumption that economic growth would bring wellbeing for all. The Co-RRI approach relies on a conceptualisation of society as a value creation system. Such system is composed of the following elements: purpose and ethics, governance, and value creation pathways (value creation and allocation flows and principles); which together combine to create desirable values, fulfilling the purpose. The purpose of a Co-RRI socio-economic system is increased (sustainable access to use of resources for) wellbeing for all, while restoring planetary ecosystems. New governance and new value creation pathways develop, in line with the system's purpose and ethics (social and environmental). These new value creation pathways rely on the emergence of a new public space, composed of resilient (P2P, commons) initiatives, collaborating with Co-RRI knowledge arenas (units aiming at implementing the Co-RRI approach) to innovate the socio-economic system, according to Co-RRI principles. It also relies on a new definition of economics as 'the efficient and sustainable

allocation of scarce resources and values to the wellbeing of all'. Grounded in deep social ethics, the Co-RRI approach addresses the procedural aspect of social justice by opening R&I systems to all societal actors: local communities, citizens, NGOs, etc. are invited to participate, through Co-RRI hubs, to design Co-RRI (research) projects: access to knowledge is democratised and non-discriminatory. The Co-RRI approach deals with the distributive aspect of Co-RRI by considering society as a value creation system, where value creation pathways are designed in order to increase fair and equal access to resources and values, and current perpetuation of social injustice finds an explanation.

Jost, J., & Kay, A. C. (2010). Social justice: History, theory, and research. In S. T. Fiske, D. Gilbert, & G. Lindzey (Eds.), Handbook of social psychology. (5th ed., Vol. 2, pp. 1122-1165). Hoboken, NJ: Wiley.

Keywords: responsible research and innovation, social justice, governance, value creation, ethics, open access

What's the impact of responsible research and innovation?

GRIESSLER, Erich

IAS – Institute for Advanced Studies, Austria

Advocates of RRI point out that "RRI is a good policy that is badly needed". It will help to align research with actual societal needs and the grand challenges our globe is currently facing; it will involve the public into science, technology and innovation and by that will fully take advantage of its creativity and knowledge; it will create an open science and will educate the public about issues of science, technology and innovation; finally it will contribute to a gender-equal society. But is RRI really such a good thing as its advocates claim? RRI also faces concerns and resistance. Its opponents argue that it might endanger the freedom of research; it might paralyze curiosity driven basic research and expose science to prejudiced and uninformed laypeople, political pressure and criteria alien to science proper; it might burdens researchers with unnecessary red tape and might slow down and, in the worst case, even obstructs innovation. But how can we truly establish the actual effects of RRI? What indicators are available to measure its impact on science itself, as well as democracy, economy and society? The EC funded project "Monitoring the Evolution and Benefit of RRI" sets out to address these questions. This paper will present indications of how the recognition of RRI in research projects had an impact in scientific, social, democratic and economic terms. It will also propose 36 indicators to monitor a set of RRI keys (public engagement, ethics, science education, open access and gender).

Keywords: RRI, impact, measurement

STREAM: General STS Topics

Session 17: Technical standardisation and STS

Chair: JAKOBS, Kai, RWTH Aachen University, Germany

And yet it moves! The role of standards in socio-technical systems' normal periods

SARDO, Stefania

BI Norwegian Business School, Norway

In researches dealing with the development, expansion and transformation of socio-technical systems, standards are examples of rules that steer actions, relationships, and technological progress (Hughes, 1983; Rip and Kemp, 1998; Geels, 2004). Systems integrators or dominant social groups design them to secure the alignment of other entities on mutual roles and attributions of functionality into a more stable form, increasingly diluting their agency within structure (Law, 1994). Indeed, these processes are said to cause rigidity, stability and irreversibility in the socio-technical system, to the point that it seems difficult - if not impossible - to change it (Callon, 1991). Because standards are assumed to be pervasive, they both contribute to and explain the obdurate maintenance of systems' normal periods (Khun, 1973; Bijker, 2006), defined as dynamically stable states where the systems progress incrementally and predictably along socio-technical trajectories (Dosi, 1982; Rip and Kemp, 1998; Callon, 1998). Taking a constructivist perspective, this article questions the process of increased solidification of socio-technical systems in normal periods, where standards are part of an undefined meso-level reducing recipients' variability and agency. Instead, the alignment of systems' entities on the roles and impacts of these protocols is not assumed. Standards are investigated as expressions of specific agents' ordering strategies (Law 1986, 1994; Lampland and Star, 2009), producing effects that might be inconsistent with how normal periods are characterized. This viewpoint is empirically illustrated through a qualitative case study that explores the construction, maintenance and use of safety standards in the Norwegian oil and gas (O&G) drilling socio-technical system. Information were gathered through interviews conducted between 2016 and 2017 with different organizations, among which oil companies, drilling contractors, equipment manufacturers, drilling service providers, public authorities and certification bodies. The analysis opens up to the multiple voices composing the O&G drilling system, illustrating both the logics behind the use of standards as organizing and predicting tools, and the variegated interactions of recipients with them. In particular, the investigation looks at the different attributions of functionality organizations assign to safety standards; how specifications and the underlying social values are perceived and defined; how they are locally interpreted and at times counter reacted, possibly giving rise to unpredictable system's transformations even in so called normal periods. The results show a lack of integrity, capillarity

and homogeneity of technical protocols, given their uneven impact on individual system's entities. In light of this, the case study opens up questions about how we can rethink the role of standards as stability and predictability tools, but also
– more generally - how we can understand normal periods in socio-technical systems.
Keywords: safety standards, normal periods, oil and gas industry, controversies, socio-technical systems

Do standards hamper innovation? Empirical reflections from the emerging field of systems medicine

PETERSEN, Imme, KOLLEK, Regine
University of Hamburg, Germany

Technical standards are often described as 'back bones' of technical objects and processes. They are supposed to ensure that technical innovations are compatible and repeatable as well as safe and of high quality. In research activities, standards are also used to facilitate coordination of social processes among actors working in different locations. Taken together, standards are assigned to construct stability across time and space, e.g. by ensuring reproducibility of data, technologies and results or by defining protocols and practices that guide measurements and experiments. In Science and Technology Studies, however, it has been carried out that standards have powerful normative implications on the course of innovation. For instance, standards are assessed as specific codified knowledge elements with high normative significance in regulation and risk assessment. As new technologies and products must be authorized for the purposes of meeting safety and quality regulations, standards have direct impact on the creation process and will continue to work when the technology is already successfully in use or the products come to the market. To this effect, standards increase the perception of the reliability of the technology or end product and legitimize scientific and technological developments. Even if the STS literature discusses these normative effects of standards, an empirically sound reflection on standards in conjunction with innovation in research is still missing. This paper aims at carefully examine the characteristics of the relation to investigate what standard and innovation mean to each other, especially in the interweaving of organizational and working practices. The empirical case under study is the emerging field of systems medicine, which is currently developing very rapidly. Systems medicine is characterized by fast-evolving high-throughput technologies for molecular profiling that produce huge amounts of data on different biological and pathological processes often summarized under the label of Omics Data. The large volume of data of different types have posed new challenges regarding data handling and processing. Tools based on bioinformatics have been developed to resolve the upcoming problems of adequate data representation and the processing of large and various datasets. At first glance, the application of bioinformatics simply seems to be an innovative tool to resolve the challenges of storing, processing and integrating Omics Data. However, a careful process tracing will show that data and knowledge discovery workflows are systematically converted by bioinformatical operating procedures. Bioinformatical standards have therefore powerful implications not only on data handling, but also on data interpretation. Hence, we will argue that standard operating procedures for data

processing have impact on data, technological innovation and knowledge production at the same time. This argument is based on an empirical study of three research consortia exploring the molecular profile of diseases to establish systems medical approaches in the clinic in Germany. Using qualitative ethnographic methods, we will explore how Omics Data are standardized by bioinformatical requirements and how the standard operating procedures are negotiated, coordinated and evaluated by the scientists using the innovative technologies in data and knowledge production.

Summary: Even if the STS literature discusses normative implications of standards, an empirically sound reflection on standards in conjunction with innovation in research is still missing. This paper aims at carefully examine the characteristics of the relation to investigate what standard and innovation mean to each other, especially in the interweaving of organizational and working practices in a research environment. The empirical case under study is the emerging field of systems medicine, which is characterized by fast-evolving high-throughput technologies for molecular profiling. Using qualitative ethnographic methods, we will explore how the standard operating procedures are negotiated, coordinated and evaluated by the scientists using the innovative technologies in data and knowledge production.

Keywords: standard, standardization, innovation, bioinformatics, systems medicine

Standardization: standard-essential patents, the FRAND commitment and open source

BARANI, Marie

Independent Researcher, United Kingdom

Standards in the ICT sector have been widespread disseminated and adopted . They have enabled the development of new business models and activities. One example is the transformation of cellphones into smartphones and the increased digitization of society. But the success of standardization in ICT comes along with legal issues related to standard- essential patents (SEPs). Patents, contrary to standard (who are made publicly available), grant their holders an exclusive right to prohibit third parties from exploiting the patented technology. If patents covering a standard are SEPs, it means that no technical alternative to those patents exists. Therefore, those SEPs could confer their holders a bargaining power they may abuse to restrict the access to the standard. To prevent such abuses, some standard-setting organizations (SSOs) require their members to commit to license their SEPs under fair, reasonable and non-discriminatory conditions (FRAND commitment). But there is no legal definition of FRAND is. Patent litigations in the ICT sector question among others the right of SEP-holders to request an injunction against an infringer and to license SEPs on a worldwide base, with a royalty rate based on the end-device.

Case law and antitrust investigations in Europe, the U.S. and Asia do not bring one harmonized solution to those questions. Some SSOs have alternative solutions to the FRAND commitment and propose royalty-free patent licenses, or Open Source licenses. One of the main SSOs, with a FRAND based IPR Policy, the European Telecommunications Standards Institute, (ETSI) has developed an Open Source project, MANO, where patents are subject to an Open Source

license.
Two questions arise from this combination of an IPR Policy based on a FRAND commitment and Open Source licenses. First, to which extend are the FRAND commitment and the specific Open Source licenses of the MANO project compatible ? Second, do Open Source licenses remove the risk of litigations and the potential uncertainty linked to the FRAND commitment? While the FRAND commitment ensures a balanced and flexible approach to SEP licensing, the MANO Open Source license request that patents are licensed royalty-free on a worldwide basis. This could impede incentives to standardize and add more complexity to licensing if some SEPs subject to a FRAND commitment are added to the MANO project: they would be subject to a potentially contradicting dual licensing (FRAND versus royalty-free). Furthermore, Open Source does not remove all litigation risks: companies holding patents on Open Source solutions, if they are not involved in the relevant Open Source community, have no duty to declare them and license them under the relevant Open Source license. One company like Microsoft is reported to make $2billion on Android patent licensing agreements.
If Open Source licenses do not provide a balanced and fair solution to all companies involved, litigation risks will not decrease. And the same issues as those related to the FRAND commitment will be raised: are patent holders entitled to an injunction and what royalty rate can they request? But there won't be any FRAND safeguard.Worldwide patent litigations related to the smartphone industry have challenged the FRAND commitment and its adaptibility to a changing ICT environment. Some companies question the right of SEP-holders to be granted an injunction on their standard-essential patents and to license them on a worldwide basis, with a royalty rate based on an end-device and not a component basis. Some SSOs are developing Open Source projects, subject to Open Source licenses.The question of this paper is whether an Open Source license would decrease legal uncertainties and litigation risks related to the FRAND commitment. This question will be analyzed under patent, contract and antitrust law, mainly in Europe and the U.S., in four sections: an introduction on benefits and risks of SEPs in standardization, a first section on legal issues related to the FRAND commitment, a second section focusing on Open Source, patent and contract law, with the analysis of one example, the MANO project and related Open Source licenses, and a conclusion.
Keywords: SEPs-FRAND-Open Source

Standards as emerging properties of socio-technical regimes. Empirical evidence from case studies on collaborative software development

SCHULZ-SCHAEFFER, Ingo, BOTTEL, Matthias
TU Berlin, Germany

Research on standardisation often has a narrow focus on the technical standards themselves, on the related interests of the different social groups involved and on the negotiation processes between them. We suggest that from an STS perspective it is useful to employ a broader concept of standard that conceives technical standards as but one component of networks of stabilized meanings, artefacts and practices that can be mutually supportive. To elaborate on

this suggestion, we refer to the concept of socio-technical regime. In the basic version of Nelson and Winter (1982) a technological regime consists of the shared cognitive routines of an engineering community. However, it soon became clear that other components have to be taken into account to explain the stability and momentum of established technologies and existing trajectories. Thus, a notion of socio-technical regimes emerged that includes cognitive routines, regulations, technical standards, sunk investments, infrastructures and competencies (cf. Geels/ Scott 2007). We employ this encompassing concept of socio-technical regime as a frame of reference for analysing standardisation in the field of software engineering. This provides a broader focus on standardisation. The usefulness of this approach shall be demonstrated with empirical findings from a project on "Collaborative Technologies and Practices in Transnational Projects of Software-Development". In this field of engineering we observe a substantial degree of homogenisation and standardisation of several of the components that enable and support collaboration in transnationally distributed software projects: (1) established process models of software development; (2) software tools that correspond with the regulations provided by the process models and are easily to be plugged into any development environment; (3) shared knowledge of software developers about the relevant process models, the related software tools; (4) shared work practices; (5) shared languages: English as shared business language, common knowledge about programming languages, shared tech-speak. It is important to note all these components interact with one another so that changes of one of the components involves changes of the other components. Viewing all these components as parts of a socio-technical regime of software development helps to understand that standardisation is more than establishing a particular technical standard but the combined effect of multiple and interacting chances of several components.

Keywords: standards, standardisation, socio-technical regimes, software development

Session 18: New frontiers of surveillance: How just is an algorithm?

Chair: GIANNI, Robert, University of Namur, Belgium

Pre-emption in border control: securitization, automation and big data

NIKOLOVA, Blagovesta
University of Namur, Belgium

With the increasing political focus on terrorism as a global threat, the border is recognized as a key element within the securitization agenda and as a place for prevention and proactive deterrence by the means of tighter checks, no-fly lists, detention sites for interrogation, etc. At the same time, borders are becoming more digital in the sense of heavy use of information and communication systems, and large scale databases for more effective governance of mobility.
The paper will analyse the digitalization of the border control process through the concepts of new surveillance (Lyon 2003, 2007), profiling (Brakel&Hert 2011) and pre-emption (Dershowitz

2006; Rosenthal 2011). It will trace how the promotion of data-driven and intelligence-led approaches changes: 1/ the assigned role and the anticipated functionality of the territorial border; and 2/ the social practice of border-ing (Wastl-Walter 2011) through
risk assessment around the notion of untrustworthy.
In an attempt to arrive at a reliable explanation of the undergoing changes, the paper will explore the intricate relations between the imperatives for speed and security as to the border control process and will argue that their mutual enhancement around the principle of immediacy (Tomlinson 2007) and the fantasy for manageability (de Goede 2008) leaves very little room for addressing not only the ethical but even the legal basis for the practices that we might summarize as prospective forensics on the border.
Keywords: border control, digitalization, pre-emption, surveillance

Dealing with everyday forms of surveillance: research implications of cloud-based mobile applications

KERPEN, Daniel, DORGEIST, Matthias**,** ZANTIS, Sascha
RWTH Aachen University, Germany

Cloud Computing (CC, “cloud”) describes computing models in which users access, e.g., networks, servers or applications and services as ubiquitous, shared pools of scalable, rapidly provisioned computing resources. Furthermore, a significant share of everyday communication is realized via cloud technologies – especially when considering the steady rise of global smartphone usage. Smartphones are extraordinarily dependent on CC infrastructures: only those provide the mobile devices and their installed applications (apps) with full functionality. Hence, CC allows developers of mobile apps to overcome limited computing, storage, and power resources of modern smartphones.
But, besides these huge advantages, the (hidden) utilization of cloud services by mobile apps leads to severe privacy concerns which is deeply rooted in information asymmetry. Information asymmetry describes the increased imbalance in power between smartphone users, service providers, and the application developers:

- although smartphone users decide which apps they use on their devices, they neither have knowledge, let alone control, over the use of cloud services by these apps. This is especially due to cloud providers’ usage of own and third-party infrastructure that hides who has access to data in the cloud.
- Furthermore, since most cloud providers are located outside the user’s own legislation, contracts and other legislative measures might only have a very limited reach of binding applicability.
- In sum, users have only few means of safeguarding their privacy realm and either are unaware of data collection performed by mobile apps or, in case of awareness, resign by caving in and simply accept data collection.

To overcome these concerns and allow users to properly assess risks of cloud usage, research on mobile ICT strives to provide transparency over the cloud services utilized by smart- phone apps. One approach (drawn from our ongoing (PhD) research project TRINICS funded by the German Ministry of Education and Research, cf. https://www.comsys.rwth- aachen.de/research/

projects/trinics/) analyzes network traffic of smartphone apps with the goal to detect and uncover (esp. hidden) cloud usage. Resulting information on cloud usage is presented to the user and put into context through anonymous comparison with her peer groups ("comparison-based privacy", i.e., users with similar sociodemographic background and interests). By doing so, the project aims at enabling smartphone app users to make an informed decision on suitable means for a more sufficient, self-determined data protection for their use of apps and cloud services. Moreover, the label of informational self-determination is expounded in this context, so that the information provided by the research does not give an unduly impression of safe use.
Against this background, our contribution sheds light on the difficulties between such an innovation project and its ethical dimensions: in its core – like many other ICT development projects –, it struggles with the dichotomy of self-determination of the individual as opposed to its "dual-use" characteristics through all-encompassing surveillance by its ubiquity/scalability and personalization/customization. Accordingly, in order to be considered as responsible and innovative research, we conceptualize our work on emerging cloud technologies as a collaborative practice between (public- and private-funded) computer scientists and social scientists and try to design it through our approach of comparison-based privacy as context-aware and reflective as possible – i.e., in terms of responsibility and ethics.
Keywords: ethics of technologies, privacy and data protection, cloud computing, smartphone applications, responsible research and innovation (RRI)

Prejudiced machineries: exploring sources of algorithmic bias and their social implications

RIEDER, Gernot
IT University of Copenhagen, Netherlands

In the age of Big Data, neutral algorithms based on agnostic statistics are said to provide a disinterested picture of reality. The promise of algorithmic objectivity has captured the imagination of both industry and government stakeholders, who continue to stress the benefits of purely fact-based recommendations. After all, "it's humans, not algorithms, that have a bias problem" (New 2015). But algorithms aren't neutral – they are written and designed by human programmers, work on and incorporate specific datasets, and function as parts of complex socio-technical assemblages. As such, algorithms can reflect the biases of their creators, of the data they are processing, and of the environments they are entrenched in, which may lead to disparate impacts and unfair discrimination (see Barocas and Selbst 2016). Based on earlier work on bias in computer systems (e.g., Friedman and Nissenbaum 1996), the paper provides an overview of sources of algorithmic bias, combining a conceptual typology with concrete empirical examples. Contra claims of computational impartiality, algorithmic knowledge production is discussed as a situated practice subject to an array of epistemic and methodological problems and challenges. In times when – according to Google's autocomplete feature – algorithms believe themselves to be taking over the world, a critical examination of increasingly pervasive forms of "algorithmic governance" (Musiani 2013) seems paramount. The paper aims to contribute to this task not only by identifying sources of bias in algorithmic

systems, but also by highlighting potential social ramifications of blind “datatrust” (Rieder and Simon 2016).

Literature:

Barocas, Solon; Selbst, Andrew D. (2016) “Big Data’s Disparate Impact.” 104 California Law Review 671.

Friedman, Batya; Nissenbaum, Helen (1996) “Bias in Computer Systems." ACM Transactions on Information Systems 14(3), 330-347.

Musiani, Francesca (2013) “Governance by Algorithms.” Internet Policy Review 2(3). New, Joshua (2015) “It’s Humans, Not Algorithms, That Have a Bias Problem.” Center for Data Innovation. Available at: https://www.datainnovation.org/2015/11/its-humans-not- algorithms-that-have-a-bias-problem/.

Rieder, Gernot; Simon, Judith (2016) “Datatrust: Or, the Political Quest for Numerical Evidence and the Epistemologies of Big Data.” Big Data & Society 3(1).

Keywords: Big Data, algorithmic governance, bias, epistemology, trust in numbers

Session 20: Ethical, legal and social aspects of biotechnologies

Chair: Bernhard WIESER, Institute for Science and Technology Studies (STS), Alpen-Adria Universität, Klagenfurt|Wien|Graz, Austria

The ownership over discoveries in life sciences: some social, economic and ethicak issues of intellectual property rights in biotechnology

MALI, Franc

University of Ljubljana - Faculty of Social Sciences, Slovenia

The issue of intellectual property rights (IPR) in biotechnology can be used as an example upon which can be seen the complexity of economic, policy and ethical challenges in the progress of the life sciences. In that sense, we can look at the issue of IPR not only from a narrow economic perspective. In the case of IPR, we also encounter broader social, legal and ethical challenges of modern progress of life sciences. The issue of ownership protection of inventions in life sciences at large has been the subject of critical and controversial expert discussions for many decades. The topic is not something new. There have been already extensively highlighted well-known stories included Diamond v. Chakrabarty case, the ‘Harvard Oncomouse’ case, Association for Molecular Pathology v. Myriad Genetics case, etc. However, it is expected that the controversial discussions around the concept of ‘ownership’ of the results of biotechnology, centred on the discourse of whether they represent natural or artificial entities, whether basic discoveries in life sciences should be or not patentable, although they can be directly exploited for commercial benefits, etc., will in the near future increase. It does mean that the questions of IPR in new emerging technologies such as biotechnology did not lose the importance in the

context of Science and Technology Studies. In the paper, I will try to present some socio-economic and ethical dilemmas around the recent dominant tendencies to come to exclusive ownership of new scientific discoveries in the most progressed fields of life sciences. The paper will be partially based on the results of empirical (qualitative) research which will be performed in the next few months among the representatives of various stakeholder groups (academic scientists, entrepreneurs and businessmen, administration at the office for IPR) in Slovenia.
Keywords: intellectual property rights, life sciences, ownership in science, responsible research and innovation

Science for policy in the genetically modified crops assessment

CHVÁTALOVÁ, Veronika
Department of Environmental Studies, Faculty of Social Sciences, Masaryk University, Czech Republic

The authorisation process of applications for marketing of genetically modified (GM) crops in the European Union (EU) is considered as one of the strictest in the world, which is illustrated by current cultivation of only one GM crop. We are repeatedly assured about its safety by a scientific body of the EU, the GMO Panel of the European Food Safety Authority (EFSA). However, the quality and ethics of science for policy in the field of GMOs has been questioned as well as the EFSA practices. This became of particular interest when the new regulatory framework for GM crops reserved the sovereignty in assessing risks for human and animal health for the EFSA. The aim of this study is to contribute to the understanding of the science–policy interface by assessing the quality and use of scientific studies focused on environmental risk assessment of GM maize MON810. In this study the "Reliability Rating and Reflective Questioning" method introduced by F. Wickson (2009) is employed, a framework in which risk assessment can be exposed to a type of extended review incorporating both natural and social science quality criteria and modes of reflection. The first step consists of a critical review of scientific studies used in the GMO Panel's Scientific Opinion on the Application for renewal of authorisation of the MON810 maize from the year 2009. I focus on the environmental risk assessment, specifically the Opinion section "Interactions between the GM plant and non-target organisms". Relevant additional studies available before the Opinion issuing are also included. The next step is to assess how was the scientific information used in the Opinion. Finally, the adequacy and appropriateness of the Panel's conclusions is evaluated. The preliminary results are based on the examination of honeybees' and earthworms' studies, two out of ten groups of non-target organisms addressed in the Opinion. Twenty one scientific works are cited in these two sections, additional ones relevant to the subject were revealed through literature survey. The scrutiny of the Opinion showed several shortcomings in the use of employed studies: I) studies are often misquoted (e.g. incorrectly cited to support certain statements or reduce the aim of the study to a certain area where no negative effects were observed), II) the assumptions or uncertainties embedded in the studies are not communicated, III) there is generally lack of critique, including cases that should have been reflected (e.g. inconsistencies, conflict of interests), in rare cases when critique is conducted, it is predominantly inappropriate, IV) results

of studies are selectively used: the pattern of omitting negative effects and further research requirements or suggestions is evident. Although the scientific information stems from generally reliable resources and the reliability of the cited studies is relatively high, the identified shortcomings limit conclusions of the Panel. Therefore, I assess the conclusion that “there is no evidence to indicate that the placing of maize MON810 and derived products on the market is likely to cause adverse effects on [honeybees/earthworms] in the context of its proposed use” as inadequate.

Keywords: GMO, science for policy, reliability rating and reflective questioning, environmental risk assessment, EFSA

The world of ICU: a socio-technical account

ISLAM, Sadaf

Sociology, Lancaster University, United Kingdom

This paper is a part of PhD research entitled “Bio/medicalization of death: The social impact of life support technologies in Bangladesh.” This research broadly looks into how have the life support technologies and increased technologization impacted on the conceptualization of death and its subsequent consequences in Bangladeshi society. Recent developments in biotechnology have resulted in the production of new forms of life and death: from cloned sheep to brain-dead bodies. Life-prolonging technologies encompass the possibility to modify elementary processes of life leading to transformations in health, illness, and death. These changes raise cultural, religious, political, and ethical questions which eventually challenge the use of these technologies in Bangladesh. It is commonly assumed that biomedical technology exists to cure human health-related needs, thereby reducing suffering, preventing premature death, and prolonging life. However, this technological advancement and the consequent ethical problems in health care have attracted public attention and concern in unprecedented ways. In this context I will present a socio-technical account of intensive care unit in Bangladeshi hospital where life support treatments take place from my ethnographic fieldwork. The objective of the presentation is to provide a description of how ICU health professionals interact with medical devices at ICU. This socio-technical account of the ICU also aims to reveal the patient family’s involvement in interacting with the medical devices. The paper will show that, life support technologies are not merely confined to performing specific treatment related tasks, but it has far-reaching impacts beyond the ICU ward which subsequently produce a specific socio-technical culture of ICU, grown out of the human-machine interactions. This socio-technical culture resulted in new forms of hybrid hope, care and death in Bangladeshi society.

Keywords: socio-technical culture, Life support technologies, bio/medicalization, hybridization of hope, care and death.

You can't stop the march of knowledge: civil society critiques of clinical trials in India

SARIOLA Salla
University of Turku, Finland

The emergence of international clinical trials in India has been surrounded by controversy. Our research traced voices of civil society organisations and resistance that opposed global trials in the country at a time when increase was at highest (2010-2011 and beyond). Contrary to the narrative of resistance to Randomised Controlled Trials as hegemonic forms of knowledge production discussed elsewhere, members of civil society organisations in India expressed confidence in RCTs as a method.
Instead, they were opposed to hierarchies in pharmaceutical assemblages and the commercialisation of research. Activism focused on promoting social justice for research participants as well as for India as a nation; with parliamentary and judicial support, the civil society organisations lobbied for tighter ethical regulations which were introduced by the Indian government in 2013. This exacerbated a decline in the number of global trials carried out in the country.
This paper shows how and why civil society organisations were able to change local research regulation beyond a formulaic approach to research ethics towards their vision of social justice. We put forward a unique case study of science and health activism where, because of their non-fundamentalist stance towards the Randomised Controlled Trials methodology and lack of wholesale denial of international research activity, civil society organisations were able to craft an alternative narrative and direction to the clinical trials industry and bring international commercial research industry under greater control.
Keywords: clinical trials, social justice, India

Agricultural Biotechnology as a Symptom

KLOTZ, Lisa Jane
Independent Researcher, Germany

Agricultural biotechnology, genome editing, neuro-bridges, and robotic prosthetics can be read as hovering betwixt and between at least the following intersectional levels: societal level, technical, economic, ethical, medicinal, metaphysical, and play level.
Genome editing furthers an economically imprinted focus on high productivity, which influences the aesthetical perception of animal and human bodies, and might in the long run be intersected with moral status. Animals and plants, especially crops, are de-animalized and de-plantized, which is a further symptom for exploitation and hierarchization.
On the basis of real-life examples this analytical approach investigates the production of social injustice in highly technologized societies. For example, over 90 per cent of pregnant women go

through voluntary abortion after having tested the likelihood of giving birth to a disabled child.
As further example the focus lies on genetically modified crops that are offered together with special herbicides. Such crops are not just plants any more, but semi-biological productive organisms. As soon as ethical and normative arguments show up, bio-engineering plays its joker that all people on earth could get enough to eat, ignoring the fact that the hierarchization within those postmodern production processes will never allow such a redistribution. Yet green-washing shows us that economic arguments still are in need for an ethical foundation. Whether the production of social injustice is inherent to the system itself or merely a side effect will be discussed, and could open up questions on how normative sociology can and should be.
Summary: This paper analyses the different intersectional levels that intertwine in highly technologized societies. De-animalization and de-plantization within bio engineering and genetically modified crops within food production processes, as well as postmodern aspirations to overcome human boundaries with human-machine interfaces might be symptoms for social injustice through hierarchization. This hierarchization may be regarded on the species-level, between healthy and disabled people, who might not be born anymore, or on a deeper level of the societal system itself. Whether or not social injustice is inherent or merely a side effect will be discussed in this paper.
Keywords: genome editing, bodily aesthetics, social hierarchies

Session 21: 1000 flowers of STS – General STS discussion

Chair: HAAS, Marita, TU Vienna, Austria

Towards a feminist theory of expertise

RICHMOND, Karen
University of Strathclyde, United Kingdom

Contemporary theories of scientific expertise - particularly those comprising the ‘third wave’ of Science and Technology Studies - offer normative, and prescriptive, accounts of the production of expert knowledge claims (Collins and Evans: 2007). The ‘wave three’ theoretical approach proposes an exclusive focus on a contemporary body of expert knowledge, as enacted by a core-set of ‘esoteric’ research scientists. This emphasis on contemporary research science flows from the assertion that past scientific disputes have been largely settled. However, the acceptance of expert knowledge claims, over an extended period of time, may not entail - as Wave Three proponents suggest - that these claims have successfully revealed ‘natural’ scientific facts. Rather, widespread acceptance may be viewed as the product of continuing social factors associated with the longevity of a dominant gender and social class, and the valency of a particular paradigm.
Further criticism of Wave Three scholarship extends to its methodological aims, whose stated objective is to unearth, and reify, a kernel of epistemologically-privileged contributory expertise.

The limitations of this approach become apparent when Wave Three approaches are enacted within other domains, beyond that of esoteric research science. Indeed, method- ological techniques, which attempt merely to unearth propositional knowledge, may lack the ability to capture more ambiguous phenomena that fall within the broad classification of practiced expertise.

In short, Wave Three proponents strive to demarcate an area for contemporary research science that is epistemologically privileged but, in so doing, limit the application of their theory. Their accounts lack both an interdisciplinary perspective and an appreciation of the ways in which gendered, and hierarchical, conceptions of expertise may distort, and silence, the feminine perspective. Therefore, a more suitable alternative theory must be proposed: one which explores the refraction of expert knowledge claims between modalities of power, and which measures the flow of knowledge across sub-system boundaries and through time. This paper posits a solution: it demonstrates the limitations of Wave Three theories and draws on empirical research into the production of forensic-scientific truth claims - and their constitution as forms of expert knowledge - in order to propose a new, contextual theory of expert knowledge: a theory which views expertise as rhizomatic rather than hierarchical. A theory which is both normative, and relational, and which highlights the flexibility and adaptability of scientific expertise: features which allow experts to shape knowledge to disparate contextual scenarios, to negotiate inconsistent (and often conflicting) rules, and to reconcile the differing requirements of separate - and overlapping - domains of knowledge, on the perceptual, cognitive, and epistemological, levels.

At the heart of the 'relational theory of expertise' is the proposition that the ability to perceive, and to account for, perceptual, cognitive, and epistemological, relationality is a defining feature of expertise. It is posited that this approach, commensurate with feminist epistemological theories, may more easily reveal the gendered nature of the production of expert knowledge and may contribute towards a more developed, and dynamic, form of standpoint theory: one which resolves many of the problems associated with existing accounts of 'mobile positioning' (Harraway: 1988). Finally, this paper invites us to ask whether feminine 'ways of knowing' may themselves constitute a form of expertise.

Keywords: feminist epistemology, STS, expertise, standpoint theory, mobile positioning

The deliberative turn in nanotechnology policy

SEIFERT, Franz

Independent Researcher, Austria

There is something special about nanotech policy. Nanotech advocates, lawyers, journalists, civil society organisations, and ethicists typically converge in a call for ethical expertise and public deliberation on nanotech. This convergence among disparate actors and national discourses is not a trivial matter. Specifically, it cannot be attributed by some 'anti-nanotech' mood in the public/media. Nanotech has hardly ever been topical in the media, and very rarely has it been targeted by activists. So, why has this 'deliberative turn' in this technology field come to pass? How did it unfold over time and across countries? The presentation gives an overview

over the analytic premises of a project which I just started. For the time being, it focuses on the conceptual framework for the analysis of this process in three countries—France, Germany and the UK—over an observation period of 15 years. It combines three aspects—a domestic perspective, transnational diffusion, and policy-oriented learning. Domestic contextual conditions account for the fact that deliberative processes in various countries manifest themselves in characteristic ways. At the same time, the deliberative turn is a transnational phenomenon since experimentation with deliberative processes in technology policy has gained currency in a number of countries during the same period. This, in turn, can be explained through transnational diffusion—the transfer of policy models between states. The concept of policy-oriented learning describes the deliberative turn as a learning process from past collective experiences such as public controversies. The study crucially draws on the 'Advocacy Coalition' approach (Sabatier / Jenkins).

Keywords: nanotechnology, democracy, advocacy coalition, policy, deliberation, elsi

Redefining Technology: The new space entrepreneurship in US and its challenges

TCHALAKOV, Ivan

Dep. of Applied and Institutional Sociology, University of Plovdiv, Bulgaria

The paper focuses on particular aspect of the emergence and development of US New Space entrepreneurship since mid-1990s: the need to depart and re-define the established technological trajectory of expendable launchers. Closely tied with military application of rocket technology (and more precisely ballistic missiles), the 'expendability' concept was deeply entrenched in the know-how, design traditions, cost assessment and regulatory framework of space launchers. The New Space entrepreneurs that entered the field in 1990s aiming at commercial markets and low-cost product and services, departed from expendability tradition and made reusability on of the corner stones of their business projects. Based on in-depth interviews with spaces entrepreneurs, carried out during his recent research stay in US, the author outlines several different paths towards reusability they followed, and the main challenges they were faced.

Summary: The paper focuses on particular aspect of the emergence and development of US New Space entrepreneurship since mid-1990s: the need to depart and re-define the established technological trajectory of expendable launchers. Closely tied with military application of rocket technology (and more precisely ballistic missiles), the 'expendability' concept was deeply entrenched in the know-how, design traditions, cost assessment and regulatory framework of space launchers. The New Space entrepreneurs that entered the field in 1990s aiming at commercial markets and low-cost product and services, departed from expendability tradition and made reusability on of the corner stones of their business projects. Based on in-depth interviews with spaces entrepreneurs, carried out during his recent research stay in US, the author outlines several different paths towards reusability they followed, and the main challenges they were faced.

Keywords: new space enterpreneurship, technology trajectory, symbiosis

Session 22: 1000 flowers of STS – Postersession

Chair: GETZINGER, Günter, Alpen-Adria-Universität Klagenfurt|Wien|Graz, Austria

CyberSpaceTriad. A tool for researching digital spaces

EGGEL, Ruth Dorothea
Institut für Volkskunde & Kulturanthropologie, University of Graz, Austria

Digital online spaces receive growing attention of scientific communities in various disciplines. Yet, methods to research these spaces, as well as the methodological implications, often remain vague and unrefined. The Internet seems to draw the awareness to visual impressions and the descriptions thereof, to questions of how “authentic” or “real” they might be, rather than to the social, political and cultural meanings of digital spaces and practices in those spaces.
The existing actor-centered methods and tools to research space and deconstruct its cultural and social significances give a lot of emphasis to physical materialized aspects of space. In a postmodern approach, where borders of materiality become increasingly blurred, it is our responsibility as social scientists to take immaterial spaces into account.
Based on a multi-methods ethnographic research, a space-triad is suggested, as a tool to offer a cultural-analytical approach to apprehend spatial constellations. It enables to see references and connections between the architecture of digital spaces, the symbolic spaces of representations and the lived and experienced spaces, revealing their social and cultural dynamics. Thus as a tool it is able to reveal mechanisms of knowledge, power and control. It makes explicit how (1) exponential development, obsolete knowledge, digital divide and difficulties in appropriating these spaces, (2) the symbolic level on which the internet is constructed as a complex and hard-to-grasp phenomenon, and (3) the architecture, with its absolute regulations through code, interface and devices, are constructing digital online spaces.
Keywords: digitalization, cyberspace, digital practice, cultural analysis, qualitative methods

Simulating a climate engineering crisis: Climate politics simulated by students in model united nations

HERRENBRÜCK, Robert Edgar, MATZNER, Nils
Alpen-Adria Universität Klagenfurt|Wien|Graz, Austria

Poster Abstract: While the awareness for climate change is steadily increasing, there has been a lack of political follow through. This has led to the discussion of alternative measures to tackle global warming – so called climate engineering (CE) measures– which have become more popular in science, policy, and civil society. However, these new technologies often pose high risks and are therefore controversial. We employed the concept of CE to build a crisis scenario

on the topic of international climate politics as part of a student simulation. This poster aims at both giving a best practice example and providing insights into plausible governance scenarios for climate engineering. The simulation utilized the rules of Model United Nations (MUN). Material from three simulation runs indicates that students experienced experimental learning that went beyond instructional teaching of international politics. These simulations were recorded, observed, and evaluated together with the students. The following categories were consulted for the interpretation of the materials: (1) divergent interests, (2) power struggle, (3) scientific and political ignorance, and (4) risk politics. Crucial problems of CE, such as technical/social ignorance and risk politics, are highlighted and compared with recent studies. All three simulation runs started with a conflicting phase and ended in cooperation.

Keywords: climate change, climate engineering, climate policy, conflict, debriefing, geoengineering, international environmental policy, Model United Nations, politics, risk perception, role-play, simulation, uncertainty, United Nations

Scientific practice: Migrant faculty in India and the United States

VARMA, Roli

University of New Mexico, United States of America

Do immigrant faculty trained in American higher education institutions adopt the outlook and practices of native US scientists and engineers (“convergence”), or do they diverge from such practices? The modern science paradigm holds that location will not matter significantly and that immigrants in either place will converge to a common standard of scientific practice. Drawing upon 134 in-depth interviews, this paper compares the scientific practices of two groups of Indian immigrant faculty in science and engineering (S&E): (i) those who studied and worked in the US and then returned to India; and (ii) those who continued to work in the US. The paper shows that the two groups differed in important ways: ease of securing grants, management of grants, research environment, professional autonomy, and research type.

Keywords: scientific practice, research culture, migrant faculty, professional autonomy, research funding