

25th SPRU PhD Forum

16 - 17 MAY 2019

Jubilee Building, University of Sussex, Falmer, Brighton

Global challenges, local contexts : Reconciling theory and practice in Science, Technology and Innovation

The SPRU PhD Forum is a free, two-day event that provides doctoral researchers with a unique space in which to present their research, network and collaborate.



www.sussex.ac.uk/spru/newsandevents/events/phd-forum

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Welcome to the University of Sussex and the 25th Annual SPRU PhD Forum, 16-17 May 2019

About SPRU

Founded in 1966 by Christopher Freeman, a pioneer of innovation studies, SPRU was one of the first interdisciplinary research centres in the field of science and technology policy and management.

Today, with over 70 faculty members, SPRU remains at the forefront of new ideas, problem-orientated research, inspiring teaching, and creative, high impact engagement with decision makers across government, business and civil society.

SPRU research addresses pressing global policy agendas, including the future of industrial policy, inclusive economic growth, the politics of scientific expertise, energy policy, security issues, entrepreneurship, and pathways to a more sustainable future. It works across a broad range of sectors including food, energy, healthcare, biotechnology and ICT.

SPRU is driven by a desire to tackle real-world questions, whilst also contributing to a deeper theoretical understanding of how innovation is shaping today's world.

SPRU has been ranked 1st in the UK (3rd in the world) by the 'Global Go To Think Tank Index report 2018' in its list of top Science and Technology think tanks. SPRU has been featured in the index's Top 10 list every year since 2013.

The University of Sussex has been ranked best in the world for development studies, by the QS World University Rankings 2018, a reflection of the outstanding research conducted at the University.

About the SPRU PhD Forum

In 1994 a small group of third year SPRU PhD students felt there were not enough opportunities for them to present their work to colleagues and peers. To remedy this, they set up the first 'DPhil Day', a day dedicated to showcasing PhD research at SPRU. Over the years the event has grown, with the addition of a 'DSkills Day', designed as a second day of skills training for doctoral researchers. Along the way, the annual event was passed on to first year PhD students and it has now become a traditional rite of passage for each new SPRU doctoral cohort to organise this unique, two-day event.

The theme this year is '**Global Challenges, Local Contexts: Reconciling Theory and Practice in Science, Technology and Innovation**' with an emphasis on drawing connections across different levels of analysis and practice in the study of science, technology and innovation. An increasingly globalised world brings challenges, but it also situates us within a framework that emphasises shared aims, such as global targets, sustainable development goals, and internationally coordinated mission-oriented research projects. However, there are issues to be tackled, not only within the common framework itself, but also in the processes of translation. From quantification and abstraction at the level of individual research projects, to the amalgamation of broad scale data and the development of generalised recommendations, theories and policies need to be reconciled with individual cases. Over the course of this forum we aim to draw together different perspectives and spark a dialogue about these issues.

The SPRU PhD Forum is a free event, which provides doctoral researchers with a unique space in which to present their research, network and collaborate. Centred on the overlapping fields of innovation, science, and technology policy studies, this event discusses research within the areas of science, politics and decision making; energy; sustainability and development; economics of innovation and industrial policy; and technology and innovation management. It also welcomes connections with all related fields including: economics, security, development, life sciences, the creative industries, and more.

This year's Forum includes:

Keynote Speeches: We are delighted and honoured to have Professor Andrew Webster and Dr Richard Morey joining us this year as our keynote speakers. Professor Webster will deliver his speech on Friday morning and Dr Morey will deliver his speech on Thursday morning.

Plenary Panels: We will continue each day with thought-provoking plenary panels on interdisciplinary topics including '**Designing, Conducting and Translating Social Science Research**' and '**Managing Uncertainty as an Early Career Researcher**'. These panels will bring together expertise from a range of inspiring academics and other key stakeholders and offer you the chance to ask them your questions.

PhD Topic Presentations: On Thursday and Friday afternoon, we will have a series of themed presentation and discussion tables. Each discussion will be initiated by 15-minute presentations from PhD students on the topic of their research,

followed by an opportunity to discuss them further, to share ideas, and to learn from one another.

A networking dinner at end of Day 1 that will take place at **Lemongrass Restaurant** in Hove (full address: 55 Church Road, Hove BN3 2BD).

▾ Programme Schedule ▶ Day-1

Thursday 16th May 2019 (Morning Sessions)

Time	Activity	Venue
9.00	Delegate Registration	Jubilee Hall
9.30	Welcome Remarks Prof Steve McGuire, Dean of the University of Sussex Business School	Jubilee Large Lecture Theatre
9.45	Keynote Speech Topic: Do scientists understand statistical uncertainty? Speaker: Dr Richard Morey Senior Lecturer at Cardiff University Chair: Stephen Scholte Doctoral Candidate at SPRU, Sussex University	
10.45	Networking Break	
11.00	Plenary Panel Session Topic: Designing, Conducting and Translating Social Science Research Panellists: Prof Maria Savona, Prof Andy Stirling, Dr Frédérique Bone, and Dr Richard Morey Chair: Stephen Scholte Doctoral Candidate at SPRU, Sussex University	
12.30	Networking Lunch	Jubilee Café area

Thursday 16th May 2019

(Afternoon Sessions: *Parallel Panel Sessions*)

Time	Activity	Activity
13.30	Panel 1 (Venue: Jubilee 144) Title: <i>Sustainability and Safety of Biotechnologies</i> Chair: Ohid Yaqub Presenters: 1) Molly Bond 2) Britte Bouchaut	Panel 2 (Venue: Arts C, room C233) Title: <i>Energy Transitions and the Effect of Political Power</i> Chair: Paula Kivimaa Presenters: 1) Sumedha Basu 2) Franco Ivan Gonzalez Zenteno
	Panel 3 (Venue: Jubilee 144) Title: <i>Creating and Responding to New Technologies in Life Science</i> Chair: Ohid Yaqub Presenters: 1) Janna Alvedalen 2) Jan Oppen	Panel 4 (Venue: Arts C, room C233) Title: <i>Finance and Infrastructure in the Transition to Low-carbon Energy</i> Chair: Paula Kivimaa Presenters: 1) Julian Gregory 2) Donal Brown
15.15	Networking Break (Venue: Jubilee Café area)	
15.45	Panel 5 (Venue: Jubilee 144) Title: <i>Control in Research: Serendipity, Steering and Autonomy</i> Chair: Adrian Ely Presenters: 1) Stephen Scholte 2) Ulrika Bjare	Panel 6 (Venue: Arts C, room C233) Title: <i>Users and Households in the Energy Transition</i> Chair: Tim Foxon Presenters: 1) Bryony Parrish 2) Abeer Aleryani
	Panel 7 (Venue: Jubilee 144) Title: <i>Perspectives on Analysing Scientific Progress</i> Chair: Michael Hopkins Presenters: 1) Josie Coburn 2) Emil Bargmann Madsen	Panel 8 (Venue: Arts C, room C233) Title: <i>The influence of Open Access Publishing/A framework to improve National STI councils</i> Chair: Martha Bloom Presenters: 1) Anna Severin 2) Rodrigo Cevallos
17.15	Closing Remarks (Venue: Jubilee Large Lecture Theatre) Prof Tim Foxon	
18.00	Coach to Brighton and Meal Meeting at Jubilee Café area at 18.00	

↳ **Speakers on Day 1** (*Thursday 16th May 2019*)



Keynote Speaker: Dr Richard Morey
Senior Lecturer at Cardiff University

Dr Morey's primary line of research is developing Bayesian hierarchical models for applications in psychological research.

Topic and abstract of the keynote speech on Day 1

Topic: *Do scientists understand statistical uncertainty?*

Abstract: Scientists work with uncertainty at all levels: uncertainty about the truth, uncertainty about their models and methods, and statistical uncertainty. For many scientists, statistical uncertainty is a central part of their work. It has been thought for decades that scientists had great difficulty with the basic logic of significance testing, which is the primary way which scientists interpret data. The current “replicability crisis,” in which many scientists are beginning to doubt the empirical foundations of whole subfields, has been blamed by some on poor understanding of statistical significance testing. The implications are far-reaching: reformers suggest sweeping away significance testing, potentially upending methods across the sciences. We show using a new experimental method and complementary qualitative reactions that scientists understand significance testing substantially better than has been previously understood. While this does not mean that there are not issues in scientific practice – even large ones – it does suggest that some avenues for scientific reform might be more fruitful than others.

Welcome Remarks: Prof Steve McGuire
Dean of the University of Sussex Business School

Closing Remarks: Prof Tim Foxon
SPRU PhD Doctoral Programme Convenor

↳ Plenary Panels Session on Day 1

Topic: *Designing, Conducting and Translating Social Science Research*



Panellist: Prof Maria Savona
Professor of Innovation and Evolutionary Economics at SPRU
Prof Savona's main research interests are on the impact of innovation on employment and wages; the structural change of the sectoral composition of economies, and particularly on the international fragmentation of production involving services, and their effects on growth and development; the economics and policy of innovation in services; spatial distribution of innovation and production activities; and the effect of barriers to innovation.



Panellist: Prof Andy Stirling
Professor of Science & Technology Policy at SPRU
Prof Stirling's research interests include technological risk, precaution, scientific uncertainty, ecological economics, innovation policy, science and technology studies, multicriteria mapping, diversity analysis, public involvement in decision-making, and technology assessment.



Panellist: Dr Frédérique Bone
Research Fellow in Medical Innovation at SPRU
Dr Bone's research interests include research evaluation using both scientometric and qualitative methods (independently or as a mix), as well as technological and firm dynamics in the biomedical sectors.



Panellist: Dr Richard Morey
Senior Lecturer at Cardiff University
(please see previous information)

▾ PhD Topic Presentations on Day 1

Panel 1 (13:30, room Jubilee 144, Jubilee building)

Title: *Sustainability and Safety of Biotechnologies*

Chair: Ohid Yaqub

Presenter 1: **Molly Bond**, Final year PhD candidate, Universities of Bristol & Exeter (co-supervised), UK

Research Topic: *Synthetic biology commodity substitution and the deterritorialization of people and plants.*

Abstract:

Bridging technoscience policy and international development, my research analyses ‘cellular agriculture’ and biosynthesis in the context of global challenges for sustainable production and consumption. Emerging from the field of synthetic biology, biosynthetic substitutes of natural products have been framed as offering a more sustainable means of production. ‘Lab-grown meat’ has received most attention, yet it is botanical and plant-based compounds which represent the majority of current R&D. As innovation has moved from scientific hype to commercial reality, my fieldwork has followed this evolving field. After three years of multi-sited-ethnographic fieldwork tracing both the global governance of synthetic biology at the UN Convention on Biological Diversity (CBD) and, through the lens of one biosynthetic product - the sweet herb known as stevia – I have mapped the assemblages that are (trans)forming relations between the Global South and Global North. This fieldwork has spanned sites in Paraguay, Brazil, USA, Europe as well as the locations of CBD COPs linking indigenous peoples, farmers, scientists, activists, entrepreneurs, policy-makers and corporates. I adopt ‘assemblage thinking’ as a conceptual framework and theoretical tool. Conceptually, assemblage accounts for the contingent and non-linear processes of innovation, the coalescing of actors, actants, artefacts, policies and ideas as an incoherent whole. Theoretically, assemblage helps determine the durability of biosynthesis and the potential for transformation and interaction with other socio-technical assemblages. Assemblages endure when they are stabilised and territorialised through particular socio-technical notions such as sustainability, scientific progress, bioeconomy or Industry-4.0, as well as forces shaping the boundaries and productive functioning of the assemblage. My fieldwork on stevia reveals early evidence that the ‘biosynthesis assemblage’ is indeed stabilising. The durability of this assemblage has significant implications for technological pathway ‘lock in’ as small farmers are disincentivised to continue cultivating crop-stevia. Despite being framed by Oxfam amongst others, as a cash

crop well-suited for 'sustainable livelihoods' of small farmers. Stevia is representative of many other high-value crops grown by small farmers in the Global South that are the target of biosynthesis innovations in the Global North. Aside from at the UN CBD, this so-called 'disruptive innovation' has received little governance or academic scrutiny both for the sustainability claims made by its proponents, but also in terms of the continuation of a technological trajectory rooted in the transfer of valuable (genetic) materials from Global South to North.

Presenter 2: **Britte Bouchaut**, PhD Candidate, Delft University of Technology, Department of Applied Sciences, Section of Biotechnology and Society, The Netherlands

Research Topic: *Safe-by-Design: perceptions and expectations of how to deal with risks of emerging biotechnologies*

Abstract:

Safe-by-Design: perceptions and expectations of how to deal with risks of emerging biotechnologies. The discovery of gene editing techniques such as CRISPR/Cas-9 has caused an increase in developments within the fields of biotechnology and synthetic biology. Expected is that this trend will continue or increase more over the upcoming years and we therefore possibly have to deal with more and unforeseen risks. Current policy falls short in acting upon these possible risks due to its linearity, meaning science informing policy, and policy informing society which hinders iterations (i.e. communication) between these groups of actors. A suggested candidate to overcome this is the concept of Safe-by-Design. This paper explores the extent to which this concept can indeed function as a suitable framework to deal with risks and uncertainties of emerging biotechnologies in practice. More specifically, this paper reflects on findings what the concepts 'risk', 'safety' and 'inherent safety' entail within the field of industrially applied biotechnologies, and how these relate to notions created alongside Safe-by-Design. Literature, interviews with experts from the field of industrially applied biotechnologies, and a stakeholder workshop revealed diverging expectations with regard to 'safety' and 'risks', and in terms of the trade-off between these notions in practice. In addition, there appears to be indistinctness in terms of responsibility allocation, including an unclear role for society. Who is 'society' and to what extent should they be involved in the debate and decision-making process of what is considered safe enough. Conclusively, a recommendation is given that referring to the concept of Safe-by-Design with, for example, Safer-by-Design might temper high expectations regarding risks and safety and might be more appropriate to be used in practice.

Panel 2 (13:30, room C233, Arts C building)

Title: *Energy Transitions and the Effect of Political Power*

Chair: Paula Kivimaa

Presenter 1: **Sumedha Basu**, PhD researcher, University of Warwick, UK

Research Topic: *Politics and International Studies department of University of Warwick: Political power and decision making in urban energy: The case of three cities in India*

Abstract:

The move towards the urban energy often implies the involvement of new set of actors, different technologies (distributed), strategies, ushering of ‘decentralised dynamics’ and reconfigured political authority. Therefore, within sustainable energy, cities need to be seen as a ‘political arena’ where friction over visions and values of transition, decision making on specific projects, and mode of implementation are bound to arise. Despite a growing international and academic interest in urban interventions on energy, the political presence of cities in the global clean energy landscape remains underwhelming. To explain their actions and inactions, literature has frequently delved into the different factors that influence governance like technical and financial capacity, autonomy and coordination. None of these factors, however, exist independently but emerge as a result of deeper structural, institutional and discursive mechanisms. Therefore, I argue that there is a strong case to explore the understandings of political power to explain the actions or inactions of urban governments on sustainable energy transitions. Governance when viewed as ‘orchestration of distinct modes of power’, as articulated by Bulkeley, can foreground these deeper mechanisms and dynamics between actors that manifest in the factors and conditions of urban decision making. Taking a critical realism approach, I study three cities of India to understand sustainable energy decision-making using the lens of political power. To achieve this, I build an analytical framework drawing from the scholarships of urban energy and climate governance and wider urban governance literature.

Presenter 2: **Franco Ivan Gonzalez Zenteno**, 1st year PhD student, SPRU, University of Sussex, UK

Research Topic: *Decolonial pathways to sustainable energy*

Abstract:

This presentation will make the case for a new research agenda for decolonizing conceptual frameworks for studying processes of change to sustainability. The limitations of broadly adopted frameworks such as socio-technical transitions and sustainable transformations for overcoming limitations inherent to modernity will

be discussed. Frameworks that do not challenge these limitations are not only not suitable for addressing sustainability but are likely to reproduce environmental and social injustices characteristic of the exclusionary perspective by which modernity constructs relations between nature and society. This presentation will analyse a case of the energy sector in the Global South (Mexico) and propose new perspectives on how to think about processes of change to sustainability.

Panel 3 (14:30, room Jubilee 144, Jubilee building)

Title: *Creating and Responding to New Technologies in Life Science*

Chair: Ohid Yaqub

Presenter 1: **Janna Alvedalen**, PhD Candidate, Circle, Lund University (Sweden) and Visiting Scholar at SPRU, University of Sussex, UK

Research Topic: *The role of large firms in Entrepreneurial ecosystems: regional resilience through local networks and high-tech entrepreneurship*

Abstract:

Through the lens of Entrepreneurial ecosystem literature, this article studies emerging entrepreneurial activities and the role of private and public actors in the event of a large multinational corporation closing down its activities in a region while leaving behind skilled labor and high-end research facilities. There is a growing interest in the entrepreneurial ecosystem (EE) as a framework for understanding the role of the context in which new high-growth firms develop. It comprises all interdependent actors and factors that enable (or constrain) productive entrepreneurship within a particular territory. The entrepreneurial ecosystem concept has been criticized for not being explicit about the role of different types of actors or their connections. This paper addresses that gap and empirically studies the role of a particular multinational/anchor firm in an Entrepreneurial ecosystem for Life Sciences in Lund, Sweden. We are looking at the role of the institutions such as business culture and strategy of a multinational pharmaceutical firm, the networks and actions taken by different private and public organizations in the region and describe the effects on the Entrepreneurial ecosystem. We find that the large multinational firm was not very much involved with its surroundings before it closed down and kept mostly for itself, absorbing human capital from the local university but having few research collaborations. We show how the resources left behind after the closure were transformed into a

wave of new high-tech spin-offs and expanded national and international networks of the region.

Presenter 2: **Jan Opper**, Researcher, Carl Friedrich von Weizsäcker-Centre for Science and Peace Research, University of Hambur, Germany

Research Topic: *Policy, Technology, Security and Knowledge: Governing Dual Use Research of Concern*

Abstract:

After the cold war, with an increased focus on terrorism and non-state actors as threats to security, life science has become a security concern and the term dual use research of concern (DURC) is often used to describe civilian research that could be misused very easily to cause harm. DURC its regulation is a topic discussed on many levels. From the yearly meeting of states parties to the Biological and Toxins Weapons Conventions, in national Governments and research laboratories, various actors are deliberating how to safeguard DURC research and its findings. Consequently, a range of policies has been suggested and implemented to handle DURC research and its findings, ranging from traditional export controls to voluntary codes of conduct and the redaction of scientific papers in academic journals. However, DURC policies and even the term DURC itself remains debated and there is no consensus on what constitutes DURC research and how it should be handled. The research project brings together critical security and critical policy studies and asks how actors understand security in the DURC context as well as how they construct security policies in the interplay with one another. It will focus on Germany as a country with a high research volume and on the role organizations of academic self-governance play as a mediator between communities, contributing to our understanding on how security policies are produced in the context of new technologies.

Panel 4 (14:30, room C233, Arts C building)

Title: *Finance and Infrastructure in the Transition to Low-Carbon Energy*

Chair: Paula Kivimaa

Presenter 1: **Julian Gregory**, PhD Researcher, SPRU, University of Sussex, UK

Research Topic: *Why Energy Infrastructure Development is a form of Innovation*

Abstract:

Our understanding of the dynamics surrounding what drives the innovation process and what innovation should encompass, has gone through a substantial

re-evaluation since Professor Joseph Schumpeter first defined its motivation in the “Theory of Economic Development” (1934): when he argued that anyone seeking profit must innovate. Equally, just as our understanding of what drives the innovation process, has come to include the practice of constant re-evaluation and reassessment; we also need to re-evaluate and reassess what our definition of innovation should embrace. To this end, this conference paper will argue that as the current literature has settled on a description of innovation as comprising ‘the successful capturing of value by the introduction of a new product or process: in a manner that is new to the world, new to a country or new to a firm’ – we can equally deduce that it is also reasonable to include in our innovation taxonomy the development of energy and other types of infrastructure: especially when they are unique, novel and value enhancing to society (through their externalities). After all, if you un-pack what an energy infrastructure development actually is: it can be observed to be a process of application and diffusion of technology, through projects – and the literature already agrees, that technology diffusion forms part of the lexicon of innovation.

Presenter 2: Donal Brown, Research Fellow, The University of Leeds, UK

Research Topic: *Worth the risk? An evaluation of alternative finance mechanisms for residential retrofit.*

Abstract:

Worth the risk? An evaluation of alternative finance mechanisms for residential retrofit. Improving energy efficiency, de-carbonising heating and cooling, and increasing renewable microgeneration in existing residential buildings, is crucial for meeting social and climate policy objectives. This paper explores the challenges of financing this ‘retrofit’ activity. First, it develops a typology of finance mechanisms for residential retrofit highlighting their key design features, including: the source of capital; the financial instrument(s); the project performance requirements; the point of sale; the nature of the security and underwriting the repayment channel and customer journey. Combining information from interviews and documentary sources, the paper explores how these design features influence the success of the finance mechanisms in different contexts. First, it is shown that a low cost of capital for retrofit finance is critical to the economic viability of whole-house retrofits. Second, by funding non-energy measures such as general improvement works, finance mechanisms can enable broader sources of value that are more highly prized by households. Thirdly, mechanisms that reduce complexity by simplifying the customer journey are likely to achieve much higher levels of uptake. Most importantly we discuss how finance alone is unlikely to be a driver of demand for whole-house retrofit,

and so instead should be viewed as a necessary component of a much broader retrofit strategy.

Panel 5 (15:45, room Jubilee 144, Jubilee building)

Title: *Control in Research: Serendipity, Steering and Autonomy*

Chair: Adrian Ely

Presenter 1: **Stephen Scholte**, 1st year PhD student, SPRU, University of Sussex, UK

Research Topic: Drug Design for Moving Targets; A Case Study of Modafinil

Abstract:

The history of drug discovery, particularly for mental illness, is seemingly inextricably entangled with the concept of serendipity. The last two decades have seen a shift however towards discovery procedures which aim to produce pharmaceuticals based on rational design principles; taking a physiological target and developing specific compounds to bind with or act upon this target, thereby treating the condition with which the physiological mechanism is associated. What these targets may be in the case of mental illness, Hacking's work would suggest, is not static, rather they are 'moving targets'. In this talk I will present preliminary findings from a case study of one contemporary drug developed for mental illness; Modafinil. Addressing along the way issues of the specificity with which goals are defined, the role of serendipity in the research process, and the question of who are the beneficiaries of this serendipity.

Presenter 2: **Ulrika Bjare**, PhD researcher, Division of History of Science, Technology and Environment, KTH Royal Institute of Technology, Sweden

Research Topic: *Researchers' perceptions of steering and autonomy in research*

Abstract:

The focus of my dissertation is on researchers' perceptions of steering and autonomy in research. I am interested in researchers' perceptions of what is considered as influential when choosing an object of study, research methods, and communicating research results. By combining macro- and micro-perspectives on the governance of research I want to look on perceptions of research autonomy in relations to university governance, funding and external influences. To what degree is the perceived ability for researchers to autonomously develop research dependent on the internal steering system and/or external factors? This concerns the researchers' possibilities for self-

organisation in relation to governing bodies that might affect the research. Specific attention will be given to the organisational setting in which research is conducted, and perceived societal expectations on research and societal engagement. The aim is to contribute to the knowledge development of research policy and university governance by focusing on the researchers' positions and perceived room for autonomy within a specific organisational setting and in relation to other, foremost external, influences. In this sense I want to contribute to the knowledge development concerning the linkages between a specific institutional and internal management structure, and the perceptions of research autonomy. At the conference, I would like to present an explorative study including interviews with researchers from a large university in Sweden. The explorative study points toward a situation where the idea of a "pure" scholarship free from external and/or intra-organisational steering appears to be an idealized one.

Panel 6 (15:45, room C233, Arts C building)

Title: *Users and Households in the Energy Transition*

Chair: Tim Foxon

Presenter 1: **Bryony Parrish**, 3rd year PhD student, SPRU, University of Sussex, UK

Research Topic: *How users interact with new technologies in the context of demand-side policies for decarbonisation*

Presenter 2: **Abeer Aleryani**, 1st year PhD student, SPRU, University of Sussex, UK

Research Topic: *Solar panels in Yemen: Traditional barriers in Renewable Energy adoption have been significantly undermined. What are some of the impacts of this mass scale adoption? What is the emerging ecosystem? How sustainable is this phenomena?*

Abstract:

Yemen is a Least Developed Country (LDC) its GDP was estimated at \$990 USD in 2016. Pre-Crisis access to electricity rate were the least in the region (less than 40% of the population) this percentage gets even lower at the rural level as estimated in a UNDP Policy Note (UNDP, 2014). Many households subsidized their power consumption with diesel powered electric generators. However, in 2011-12 coinciding with the "Youth Revolution" and the eventual deposing of the former president the electricity crisis reached new heights with power cuts lasting

for days at a time. The crisis reached a climax by the start of the war which caused a complete collapse of the electricity grid coupled with the severe shortages of fossil fuels supply needed to power privately owned generators. By 2015 the whole country suffered a complete electricity blackout for almost a year. This is when solar panels and related accessories (e.g. batteries) imported from China and India flooded the market. The dollar figure for imported solar panels reached \$40 million in that year alone while batteries and wires reached \$90 million (Al-Monitor, 2016). According to the Small and Micro Enterprise Promotion Service (SMEPS), a development agency in Yemen) solar panel sales have increased by more than 2000 percent since March 2015. The demand for solar panels has become so widespread that people can purchase them from pharmacies/drug stores in the capital. Traditional barriers in Renewable Energy adoption were significantly undermined. What are some of the impacts of this mass scale adoption? What is the emerging ecosystem? How sustainable is this phenomena? These are some of the questions we will try to investigate.

Panel 7 (16:30, room Jubilee 144, Jubilee building)

Title: *Perspectives on Analysing Scientific Progress*

Chair: Michael Hopkins

Presenter 1: **Josie Coburn**, 1st year PhD student and research assistant, SPRU, University of Sussex, UK

Research Topic: *Funding research for diseases of the rich and diseases of the poor: what role for serendipity?*

Abstract:

Some areas of medical science attract especially large amounts of research funding and these tend to address disproportionately diseases affecting rich populations. Other diseases attract less research funding despite the global burden of disease being higher and typically these affect poor populations. In recent years, there have been efforts to provide more funding for 'poverty-related and neglected diseases' (PNRDs) and to evaluate the impact of increased funding, but further progress is needed as large inequalities remain. The term serendipity refers to unexpected beneficial discoveries. There are numerous examples of where serendipity has played an important part in scientific discoveries and it has frequently been invoked as a rationale for funding basic science. However, we have a limited understanding of the role of serendipity in the research process. This research will map the relationships between grants, publications, patents and drugs in research for diseases of the rich and research

for diseases of the poor to analyse the different types of serendipity and the mechanisms involved. In a selection of cases where serendipity appears to be playing a role, interviews will be carried out with key stakeholders to understand the role of serendipity in greater depth. Analysing serendipity in research in this way will not only build on our understanding of the role of serendipity in research, but also provide evidence for why and how we should fund research, in particular where there is a need to tackle complex societal challenges such as PRNDs.

Presenter 2: **Emil Bargmann Madsen**, PhD candidate, Danish Centre for Studies in Research and Research Policy, Department of Political Science, Aarhus University, Denmark

Research Topic: *A Matthew Effect in Topic Prominence? The Concentration of Funded Research Topics in Denmark and the UK*

Abstract:

The misalignment between societal needs and the priorities of conducted research have spurred calls for more attention to what types of research is actually funded. At the same time, published research exhibits strong path dependency by becoming more focused on well-established and reoccurring topics. The distribution of attention over various topics reflect the broader political economy and power structures in science, but whether path dependency starts already at the funding stage is largely unknown. In this article, I ask how skewed and path dependent the distribution of research funding is with respect to research topics. Using data on public funding of more than 50000 research projects in Denmark and the UK since 2006, I show that competitive public research funding is consistently concentrated on a minority of topics. Furthermore, these privileged topics continue to attract the majority of funding over time.

Panel 8 (16:30, room C233, Arts C building)

Title: *The influence of Open Access Publishing/A framework to improve National STI councils*

Chair: Martha Bloom

Presenter 1: **Anna Severin**, PhD Candidate, University of Bern, Swiss National Science Foundation, Switzerland

Research Topic: *How open access (OA) affects publishing practices across academic disciplines*

Abstract:

This paper explores how open access (OA) affects publishing practices across academic disciplines. We aimed to answer two questions: First, how do different disciplines adopt and shape OA publishing practices? Second, what discipline-specific barriers to and potentials for OA can be identified? In a first step, we identified and synthesized relevant bibliometric studies that assessed OA prevalence and publishing patterns across disciplines. In a second step, and adopting a social shaping of technology perspective, we studied evidence on the socio-technical forces that shape OA publishing practices. We examined a variety of data sources, e.g. publisher policies and guidelines, OA mandates and policies and author surveys. We found that scholarly publishing has experienced a shift from “closed” access to OA as the proportion of scholarly literature that is openly accessible has increased continuously. The shift towards OA is however uneven across disciplines in two respects: First, the growth of OA has been uneven across disciplines, which manifests itself in varying OA prevalence levels. Second, disciplines use different OA publishing channels to make research outputs OA. We conclude that historically grown publishing practices differ in terms of their compatibility with OA, which is the reason why OA can be assumed a natural continuation of publishing cultures in some disciplines, whereas in other disciplines, the implementation of OA faces major barriers and would require a change of research culture.

Presenter 2: **Rodrigo Cevallos**, Doctoral Researcher, Universidad Autónoma de Madrid: National Policy Councils for Science, Technology and Innovation, Spain

Research Topic: *A scheme for their structural definition and an example of implementation*

Abstract:

National Policy Councils (NPCs) for Science, Technology and Innovation (STI) have become a common institutional arrangement of the governments to overcome

the problems of coordination derived from the complexity of the National Innovation Systems (NIS). These organizations are based on a deliberative democracy approach of governance, and are supposed to involve different stakeholders in defining long-term goals for science, technology and innovation, the strategy to achieve these goals and monitoring the pace of its implementation. However, these councils are not homogenous and governments face several options to devise the proper council for their purposes. There is a lack of a universal concept regarding these organizations that induces both theoretical and analytical difficulties. This article proposes a scheme for the definitions regarding the structure of the council and presents as a research case the definition of the Chilean National Council of Innovation for Competitiveness, as an example of this scheme based on a developing country. The proposed scheme is based on previous studies and reports developed by the OECD and VINNOVA, among others, and provides a standard tool for the analysis of these organizations –which may help in their categorization and comparisons– and therefore in their implementation.

Programme Schedule ▶ Day-2

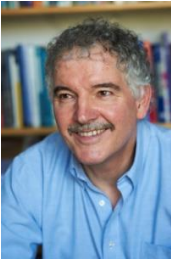
Friday 17th May 2019
(Morning Sessions)

Time	Activity	Venue
9.30	Opening Remarks Prof Gordon Mackerron, Interim Director of SPRU	Jubilee Large Lecture Theatre
9.45	Keynote Speech Topic: Science, Technology and Innovation Studies: The uncertainties and challenges of engagement Speaker: Prof Andrew Webster, Professor of Sociology of Science and Technology at University of York Chair: Benardo Caldarola, Doctoral Candidate at SPRU, University of Sussex	
10.45	Networking Break	
11.00	Plenary Panel Session Topic: Managing Uncertainty as an Early Career Researcher Panellists: Dr Sarah Robins-Hobden, Dr Chris Wood, and Dr Bipashyee Ghosh Chair: Phillippa Groome, Doctoral Candidate at SPRU, University of Sussex	
12.30	Networking Lunch	
		Jubilee Café area

Friday 17th May 2019
(Afternoon Sessions: *Parallel Panel Sessions*)

Time	Activity	Activity
13.30	Panel 9 (Venue: Jubilee 144) Title: <i>Collaboration, Industry and Innovation</i> Chair: Youngha Chang Presenters: 1) Nuttapon Nutipanich 2) Horacio Gonzalez	Panel 10 (Venue: Jubilee G22) Title: <i>Diffusion of Technology via Networks and Collaborative Partnerships</i> Chair: Ed Steinmueller Presenters: 1) Paolo Gerli 2) Evgeniia Filippova
	Panel 11 (Venue: Jubilee 144) Title: <i>R&D Innovation Policy and Centres of Excellence</i> Chair: Matias Ramirez Presenters: 1) Ema Talam 2) Pavel Corillocla	Panel 12 (Venue: Jubilee G22) Title: <i>Negotiating the Social in Sustainable Development: Public versus Private</i> Chair: Adrian Smith Presenters: 1) Phillippa Groome 2) Ahlem Faraoun
15.15	Networking Break (Venue: Jubilee Café area)	
15.45	Panel 13 (Venue: Jubilee 144) Title: <i>Addressing Innovation and Higher Education Challenges with the Lego Serious Play Practice</i> Chair: Gary Bell Presenters: 1) Bernardo Cantone 2) Vasileios-Krallis Gkogkidis	Panel 14 (Venue: Jubilee G22) Title: <i>Examination of Technological Development in Energy Transitions and Green Technologies</i> Chair: Ben Martin Presenters: 1) Laura Norris 2) Fabrizio Fusillo
	Closing Remarks (Venue: Jubilee Large Lecture Theatre) Prof Ed Steinmueller	

↳ **Speakers on Day 2** (*Friday 17th May 2019*)



Keynote Speaker: Prof Andrew Webster

Sociology of Science and Technology at York University

Prof Webster's main research interests relate to the sociology of science and technology, and in particular the development and implications of emergent technologies in the biosciences and biomedicine, including regenerative medicine, pharmacogenetics and stem cells. Other research interests relate to innovation, science policy, regulation and the evaluation of new health technologies.

Topic and abstract of the keynote speech on Day 2

Topic: *Science, Technology and Innovation Studies: the uncertainties and challenges of engagement*

Abstract: Developing an academic career is challenging enough as an early career researcher, whether as PhD or Postdoc. Apart from the writing, grant getting and networking, there is the additional challenge of embracing research funders' (e.g. ESRC, EPSRC, I-UK) moves towards greater cross-disciplinary research, policy engagement and showing impact. SPRU has a long track-record of working on these different fronts, so opportunities for different forms of engagement will be more likely, especially in the STIS field. This talk explores some of the uncertainties and challenges that one encounters on such a journey, drawing on my own and other's work. I also suggest possible sites where policy engagement might be especially productive and worth considering as a young researcher. I give a brief example of how a recently completed research project of mine has led to considerable impact and how this happened and continues today, drawing out some lessons from that.

Opening Remarks: Prof Gordon Mackerron

Interim Director of Science Policy Research Unit (SPRU)

Closing Remarks: Prof Ed Steinmuller

Professor of Information & Communication Technology Policy at SPRU

↳ Plenary Panels Session on Day 2

Topic: *Managing Uncertainty as an Early Career Researcher*



Panellist: Dr Sarah Robins-Hobden
Learning and Development Consultant

Dr Robins-Hobden is an escaped academic, helping people close the gap between where they are, and where they want to be, with bespoke coaching and training. Her superpower is empathy, and her kryptonite is her own inner critic. You can find out more here: www.robinshobden.com



Panellist: Dr Chris Wood
Researcher Development Manager at the University of Exeter

Dr Wood was a senior research scientist at the Royal Botanic Gardens, Kew. He has supervised a number of PhD students and managed post-doctoral researchers. He is an editor of a plant-biology related international peer review journal. He still manages to do some research on the 'side' and works with colleagues in New Zealand and Australia to enhance orchid and palm conservation.



Panellist: Dr Bipashyee Ghosh
Research Fellow at SPRU, University of Sussex

Dr Ghosh is working on Deep Transitions & Transformative Innovation Policy (TIP) Consortium projects. She has recently completed her PhD, thesis titled '*Transformations beyond experimentation: Sustainability transitions in megacities*'. Her current work includes understanding rules of Deep Transition, focusing on AI & Digital systems and developing experimentation tools for TIP.

▾ PhD Topic Presentations on Day 2

Panel 9 (13:30, room Jubilee 144, Jubilee building)

Title: *Collaboration, Industry and Innovation*

Chair: Youngha Chang

Presenter 1: **Nuttapong Nutipanich**, 1st year PhD student, SPRU, University of Sussex, UK

Research Topic: *Interactions between Universities and Industries within a National Innovation System: the Case of Food Sector in Thailand*

Abstract:

Universities represent vital actors within the National Innovation Systems (NIS). In these systems, the relationship between universities and industries is an increasingly critical element. Unfortunately, despite the growing literature on university technology commercialisation, university and industry linkages (UILs), and the role of universities within innovation systems, these debates are still largely dominated by research on the US context and to a smaller extent Europe, with little published scholarly research on universities in Asia. Moreover, while a number of international comparative studies have been carried out on the interplay between universities and business, these tend to focus on the large, advanced G7 economies. Therefore, a lack of appropriate explanation of UILs, and the still-limited number of comparative studies regarding the relationship between universities and external stakeholders in Asia, rather limit the ability of Asian policy makers to share with each other relevant policy lessons and institutional frameworks for university roles in their respective NIS's. To fill this research gap, the aim of this research is to (1) identify the current in-country mechanisms and characteristics of university and industry interactions, (2) to investigate the influencing factors (facilitating OR impeding) for those interactions, (3) to explore how UILs can be improved from the current position, and finally (4) to examine how UILs effect the performance of the NIS. All these research aims will be pursued using the case of food sector in Thailand.

Presenter 2: **Horacio Gonzalez**, Doctoral Research at Hunter Centre for Entrepreneurship, University of Strathclyde, UK

Research Topic: *Accelerating the energy transition in Scotland via the new alliance of Davids and Goliaths*

Abstract:

Energy transition is considered one of the key challenge that modern society must face today, resulting in considerable attention from academia, public policy and industry. The conversion of energy matrix involves, besides technological novelty, an extensive change in socio aspects, such as user practices, regulation and industrial networks, adding extraordinary complexity. At the heart of the current energy sector are incumbent firms, such as oil and gas majors and energy utilities, who have vested interest in maintaining “business as usual” and avoid transformative change. Recently, nevertheless, we have seen these incumbents’ profits hit, which combined with the societal demand for low-carbon alternatives, have created the assumption that incumbents need to incorporate radical green solutions. On the other hand, those transformative changes are not often present in incumbent’s nature of routine efficiency, in which the dominant criteria frequently view them as anomalies. For such reason, innovation prefers to develop in niches, away from incumbent’s influence. In this case, the traditional theoretical standpoint to explain the relationship between incumbency and niche innovation has been focus on overcoming each other. However, the complexity of energy transition demands a different approach of collaboration, in which their complementary skills of power (incumbents) and technology freshness (niche innovations) are likely to propel a future energy sustainability. The present doctoral research address the issue, identifying mechanism that incumbents use to connect with niche innovation in order to transform their core business; and, at the same time, evaluating how niche innovation use such leverage for scaling up. Hence, the main contribution of this research is understand how this potential alliance can boost the energy transition. Moreover, it can provide insights to evaluate other relationships between incumbency and niche innovation in different technology transitions, offering valuable contribution for theory and practice in science, technology and innovation.

Panel 10 (13:30, room Jubilee G22, Jubilee building)

Title: *Diffusion of Technology via Networks and Collaborative Partnerships*

Chair: Ed Steinmueller

Presenter 1: **Paolo Gerli**, Doctoral researcher and lecturer, Newcastle Business School, Northumbria University, UK

Research Topic: *Comparing alternative approaches for broadband diffusion (local public networks, public-private partnerships and community networks) to understand their impact upon the*

development of broadband markets in three EU countries (Italy, Spain and the UK)

Abstract:

Over the past twenty years, the diffusion of broadband has become a priority to exploit the socio-economic benefits of digitisation. However, the distribution and usage of digital technologies has differed widely between and within countries, due to market failures in the supply and demand of broadband. Public and private players have long cooperated to address such failures through a wide array of initiatives, but some geographic areas and social groups still struggle to access and use broadband across both developed and developing countries. This research compared alternative approaches for broadband diffusion (local public networks, public-private partnerships and community networks) to understand their impact upon the development of broadband markets in three EU countries (Italy, Spain and the UK). The qualitative case study analysis explored why most initiatives failed to correct market failures and helped identifying the factors affecting their outcomes. Whereas extant literature focused on the relationship between public and private players, consistent with the market failure theory, this research revealed the fundamental contribution of local stakeholders to the success of broadband projects. Furthermore, the case study analysis highlighted the influence of the geographic and political context on the outcomes of public interventions, as well as the implications of different broadband technologies. Drawing upon these findings, the current theoretical framework based on market failures was integrated to reflect the complexity and dynamicity of broadband markets. Government failures in broadband markets were also conceptualised and policy recommendations were outlined to address the shortcomings of the current EU regulatory framework.

Presenter 2: **Evgeniia Filippova**, Senior scientist prae-doc, Research Institute for Cryptoeconomics, WU Vienna University of Economics and Business Administration

Research Topic: *Understanding the evolutionary path of Blockchain and its scope for improvement – an acknowledged feature of a GPT - in line with the industrial dynamics and GPT literature*

Abstract:

General Purpose Technologies, or GPTs are defined in the economic literature as the key technologies that shape the economy and cause substantial changes in economic, political and social structures (Bresnahan and Trajtenberg 1995; Lipsey et al. 2005; Cantner and Vannuccini 2012). Despite the large conceptual literature base on Blockchain potential to revolutionize the current economic system, there

is a lack of empirical research on its economic nature and the course of technological development. The paper at hand covers this research gap by providing the quantitative approach aimed at understanding the evolutionary path of Blockchain and its scope for improvement – an acknowledged feature of a GPT - in line with the industrial dynamics and GPT literature. The longitudinal analysis of Blockchain-related patents from PATSTAT and their rule-based classification both from technological and application perspectives is complemented by the study of Blockchain media landscape to provide insights into the social context in which it emerges. The increasing amount of patents related to essential technical issues, such as security, scalability, and usability contribute to wider adoption of the technology, whereas the positive sentiment in the media associated with Blockchain creates beneficial social context for its development. The empirical results advance the claim that Blockchain does show a positive scope for improvement peculiar to the GPTs in the making.

Panel 11 (14:30, room Jubilee 144, Jubilee building)

Title: *R&D Innovation Policy and Centres of Excellence*

Chair: Matias Ramirez

Presenter 1: **Ena Talam**, PhD student, Staffordshire University, UK

Research Topic: *A critique of the user-cost approach to evaluating the effectiveness of R&D tax credits*

Abstract:

R&D tax credits are one of the two most important policy instruments used to promote business R&D and innovation and are substantial and increasing in size in a large number of countries (e.g. in the UK, according to the latest statistics, the annual cost of R&D tax credits was £3.5 billion for 2016-2017). When it comes to evaluating the effectiveness of R&D tax credits in achieving their objective, there are two streams of literature that apply different approaches: (i) that applies standard policy-evaluation instruments and in order to account for R&D tax credits uses either a dummy variable or the value of the credit granted to the firm; and (ii) that applies standard policy-evaluation instruments and in order to account for R&D tax credits calculates the user-cost of R&D. The advantages and disadvantages of the both approaches are rarely addressed in the literature, and to the best of our knowledge, no study has explored the approaches thoroughly. This paper is a critique of the user-cost approach to evaluating the effectiveness of R&D tax credits. We begin by questioning whether the user-cost of capital provides adequate theoretical foundations for the user-cost of R&D and continue

by arguing (i) that at least one of the explicit assumptions of this approach cannot be accepted; and (ii) that – even granted its theoretical foundations – the user-cost approach suffers from intractable measurement problems. We conclude that, contrary to common practice, the user-cost approach should no longer be relied upon as the sole approach to evaluating the effectiveness of R&D tax credits.

Presenter 2: **Pavel Corillocla**, 3rd year PhD student, SPRU, University of Sussex, UK

Research Topic: *Centres of excellence in Chile and Peru: What is new and what is different?*

Abstract:

Universities and their interactions with firms have become increasingly important for both developing and developed countries to improve and maintain their competitiveness in the global market. For that reason, countries have been implementing several initiatives to promote more effective university-industry linkages (UILs). Among these attempts we identified the so-called Centers of Excellence (CoE) for research and innovation, which are partnerships between academic and industrial actors with a medium to long-term approach. These partnerships are constituted as boundary-spanning structures for bridging those two worlds and, therefore, they have the participation of multiple actors, interacting with one another through a variety of channels.

CoE programmes have mainly been implemented in and studied for developed countries. Some of them can be track back to the 1980s (the US and Canada), while other countries have launched similar programmes more recently; for instance, Finland in 2007, the UK in 2010, and Germany in 2011. Following this trend, some Latin American countries embraced this type of schemes: Chile in 2010, Brazil in 2011, and Peru in 2014. In case of Chile and Peru, the participation of international actors is required.

In this study, we argue that CoE are not a type of channel of interaction, as part of the dedicated literature states, they are rather contexts within which several channels of interactions between different actors are developed. For that reason, based on a comparative case study between CoE in Chile and Peru, we explore how interactions between universities, firms and international partners work within those centers and, by doing so, we explain what is new in these schemes and how different they are compared to those implemented in developed countries.

Our results show that CoE in Chile and Peru have been constituted as partnerships between three actors: local universities and research organisations, local firms, and international partners. However, they show certain differences in terms of their internal organisation, levels of involvement of their partners, leadership, levels of collaboration, and the importance of some channels of interaction. They are different compared to the previous experiences in the Chilean and Peruvian systems, and show some similarities and differences compared to experiences in developed countries.

Panel 12 (14:30, room Jubilee G22, Jubilee building)

Title: *Negotiating the Social in Sustainable Development: Public versus Private*

Chair: Adrian Smith

Presenter 1: **Phillippa Groome**, 1st year PhD student, SPRU, University of Sussex, UK

Research Topic: *Measuring gender equality in UK infrastructure policy*

Abstract:

This research will critically examine the numbers used to reform gender equality in the UK infrastructure sector. Particular interest will be paid to numerical evaluations of gender equality within the UK Social Value Act 2012; this legislation requires government-procured infrastructure projects to consider how their delivery can 'secure wider social, economic and environmental benefits'. Beneath the numbers lies a broader research problem: where are the women in UK infrastructure? As a traditionally male-dominated sector, infrastructure has struggled to recruit and sustain female talent. This challenge has been attributed to persistent and entrenched gendering of the institutional field both structurally and culturally. This research seeks to closer examine the quantification of gender equality in changing such institutional norms.

Presenter 2: **Ahlem Faraoun**, PhD Student, Sociology, University of Sussex, UK

Research Topic: *Techno-Nationalism under the Abe Government: Japan's National Identity and Foreign Policy from 2013 to 2020*

Abstract:

The aim of this research project is to provide a critical analysis of the reconstruction of Japan's identity and behaviour as a nation-state after the return of the Liberal Democratic Party (LDP) to power in late 2012, with a focus on the rise of "techno-nationalism" broadly defined as the use of technology for the achievement of national interests. Using Josuke Ikeda's concept of "in-between-

ness” as Japan’s quest for national “autonomy”, I will look at how the post-2012 political agenda, characterized by revisions of domestic and foreign policies, represents an effort towards this quest by attempting to redefine the country’s position in world politics in terms of economy and security. The theoretical underpinnings of this study will be based on Shiro Sato’s concept of utopian realism as a Japanese theory of International Relations, which provides a framework to analyze the techno-nationalist characteristics of this agenda. I hypothesize that the latter has two strategic dimensions: strengthening national unity, and reinterpreting relations with key partners on the regional and global levels, both of which are performed through discourses on the country’s military and non-military technology development and use. Epistemologically, my study will be founded on a critical realist paradigm partially based on the work of Heikki Patomaki, which presents identity and decision-making as resulting from causal and relational mechanisms as well as inter-subjective meaning-making. I will operationalize this epistemology through a qualitative interpretive approach consisting of the analysis of government-issued texts using the methods of Directed Content Analysis and Discourse-Historical Approach. This will be achieved through an exploration of textual, inter-textual and contextual elements shaping identity and difference for strategic autonomy.

Panel 13 (15:45, room Jubilee 144, Jubilee building)

Title: *Addressing Innovation and Higher Education Challenges with the Lego Serious Play practice*

Chair: Gary Bell

Presenter 1: **Bernardo Cantone**, PhD Researcher, SPRU, University of Sussex, UK

Research Topic: *The Economic Impact of Firm’s Knowledge Search Focus*

Abstract:

From an organisational perspective, the process of creating technological novelty requires significant resources. Most well-established firms are often too bureaucratic and myopic to offer the type of environment that can develop novel inventions. Firms must break away from existing paradigms to develop capabilities for the generation of novel inventions. Furthermore, firms must continuously scan for sources of new knowledge that can increase their potential to generate radical inventions. Thus, firms should balance the exploration of new possibilities with exploiting their existing competences; although exploration contributes to future innovation, its economic impact may vary significantly. This

exploration process itself has a high level of uncertainty and chance of failure compared to exploiting existing competences. Exploration can produce such low levels of return that the firm may never recover its original investment. Furthermore, a firm might generate highly novel inventions through the exploration process, but these may make little impact in the marketplace as its utility is either poorly understood or badly marketed. Thus, a firm's knowledge search focus may provide differing outcomes between its impact on innovation and its economic performance. This paper separates the economic value from the novelty of firms' innovative output and seeks to measure the economic impact of distinct knowledge search focuses. Through adopting knowledge search indicators previously developed, this chapter links the scope and depth of external knowledge search to firms' financial performance and deliver insights as to how particular search strategies can affect a firm's financial performance.

Presenter 2: **Vasileios-Krallis Gkogkidis**, 1st year PhD student, SPRU, University of Sussex, UK

Research Topic: *Facilitating Collaboration during the Front End of Innovation with the Lego Serious Play Practice: A Comparative Study Between Firms and Non-Profits*

Abstract:

Many researchers have concluded that the first stages of innovation also called the Front End of Innovation influences significantly the outcomes of the whole innovation process, and therefore, any improvement may have a positive impact on the success rate of new products and services (Khurana & Rosenthal 1998; Riel, Neumann, & Tichkiewitch, 2013; Wowak, Craighead, Ketchen, & Hult, 2016). Collaboration among diverse innovation teams during the Front End of Innovation (FEI) poses a challenge to organisations (Carlile, 2002), a challenge that requires crossing the boundaries between different disciplines and specialisations in a diverse team to improve collaboration and foster continuous innovation in organisations (Leonard, 1995). This research theorises that the Lego Serious Play practice (Roos, Victor & Statler, 2004) is being used by organisations as a tool to help facilitate these early innovation processes among diverse teams and the Lego bricks used during these workshops act as Boundary Objects between team members. Boundary objects as defined by Star & Griesemer (1989) are objects that exist between different communities and groups and offer a common "ground" for people belonging to these different communities or groups to work together towards a common goal. Aim of this study is to utilise Boundary Object

theory and get a better understanding of how firms and non-profit organisations use Lego Serious Play workshops to facilitate collaboration among diverse innovation teams during the first stages of innovation.

Panel 14 (15:45, room Jubilee G22, Jubilee building)

Title: *Examination of Technological Development in Energy Transitions and Green Technologies*

Chair: Ben Martin

Presenter 1: Laura Norris, PhD Researcher, Cardiff University, UK

Research Topic: *The region as an actor in the emerging Marine Energy Sector in Wales Energy transitions*

Abstract:

The region as an actor in the emerging Marine Energy Sector in Wales Energy transitions are transforming regions; this paper will consider the way in which structural elements (region, institutions), network features (knowledge sharing, proximity), and agency characteristics (social capital, intermediaries) contribute to the proliferation of a novel technology. The Multi-level perspective will be complemented with innovation, geography, and network literature to consider the role of the region in facilitating system change. Utilising semi-structured interviews and the Q methodology, the experiences of innovation system actors within the Marine energy industry in Wales have been sought to understand this emerging industry, a context rarely considered by transition literature. South Wales has excellent wave resources in a region that is a major UK energy port, declining oil and gas has brought about local action to encourage the development of this industry to bolster regional development. The formation of a regional network to promote marine energy activity has evolved into a national organisation that forms an extensive knowledge network, and acts as an intermediary for the promotion of the industry. In the North of the country, the Nuclear industry and its significant impact on employment has distracted focus from the presence of innovative tidal technologies. This is particularly poignant due to the regional branding of ‘Anglesey Energy Island’ as an arm of Local Government development activity. This demonstrates that regional economic development is a more distinct actor within transitions than previously anticipated. In understanding the dynamic role of the region, a contribution can be made to understanding the spatial impacts of the energy transition. Economic geography researcher undertaking a PhD exploring the proliferation of marine energy technology in Wales; utilising literature that includes TIS, ANT, social

capital, and knowledge networks (amongst others) to understand how Transition Management theories like the Multi-level perspective may be applied to industries currently undergoing transition.

Presenter 2: **Fabrizio Fusillo**, PhD Student, Department of Economics and Statistics "Cognetti de Martiis", University of Turin and Collegio Carlo Alberto, Italy

Research Topic: *Investigating the knowledge recombination patterns of Green Technologies (GTs) in search phase (knowledge sources) and in production phase (knowledge generation)*

Abstract:

A large body of existing literature extensively studied environmental innovations as a whole, highlighting their distinctive traits. However, only a few studies analyzed the specific features of green technologies in the early phases of the invention process. The aim of this paper is to investigate the knowledge recombination patterns of Green Technologies (GTs) in search phase (knowledge sources) and in production phase (knowledge generation). The paper contributes and extend existing literature in several ways. Firstly, I investigate the dynamics underlying the generation of GTs, focusing on how and to what extent green invention make use of more diversified knowledge sources and recombine different pieces of knowledge. The second contribution of the paper is related to the understanding of the specific features of GTs with respect to "traditional" or non-green technologies. I exploit a large sample of European patent data, from 1980 to 2012, to investigate the degree of diversity of green inventions. Using the Integration Score (Rao-Stirling) as an index of technological diversity I compare the features of Green Technologies with a control sample of "Traditional Technologies", accurately drawn from the universe of all patent applications by performing a Propensity Score Matching. Empirical results suggest that, even controlling for a number of typical characteristics which may affect diversity, Green Technologies systematically show a higher degree of diversity when compared to non-green ones. Moreover, the generation of green technologies involves the recombination of dispersed pieces of knowledge which are often distant from each other in the Technological Space.

↘ Practical Information



Connectivity

The University of Sussex uses the "eduroam" network which is an international standard for education. If you already have an eduroam login, it should work at Sussex too.



Twitter

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#Spruforum2019

For live tweets at plenary panel sessions and general updates, follow:

@SPRU_Forum



Networking Dinner 16th May

All registered participants are invited to the conference dinner taking place on **Lemongrass Restaurant** in Hove from 6.30pm – 10pm.

Full address of Lemongrass Restaurant: 55 Church Road, Hove BN3 2BD

Please note all registered participants meet at **Jubilee Café area** at **6pm** in order to go to the provided coach leaving **Bramber House** at **6.15pm**. Dinner will be at 6.30pm at Lemongrass Restaurant.



Transportation *(how to get to the University of Sussex)*

By train

- You can reach the University of Sussex directly from Brighton Station and Lewes Station. Falmer Station is directly opposite the campus. You can walk to the campus from the station through a subway under the A27. Follow signs for the University of Sussex (the University of Brighton also has a campus at Falmer).

- You can get from Brighton to Falmer in nine minutes by train. Four trains an hour go to Falmer during the day. If you are travelling from London and the west, take a train to Brighton and change there for Falmer.
- The journey time from London to Brighton is just under an hour. You can also change at Lewes for Falmer, if you are coming from the east.
- See National Rail Enquiries for train times.

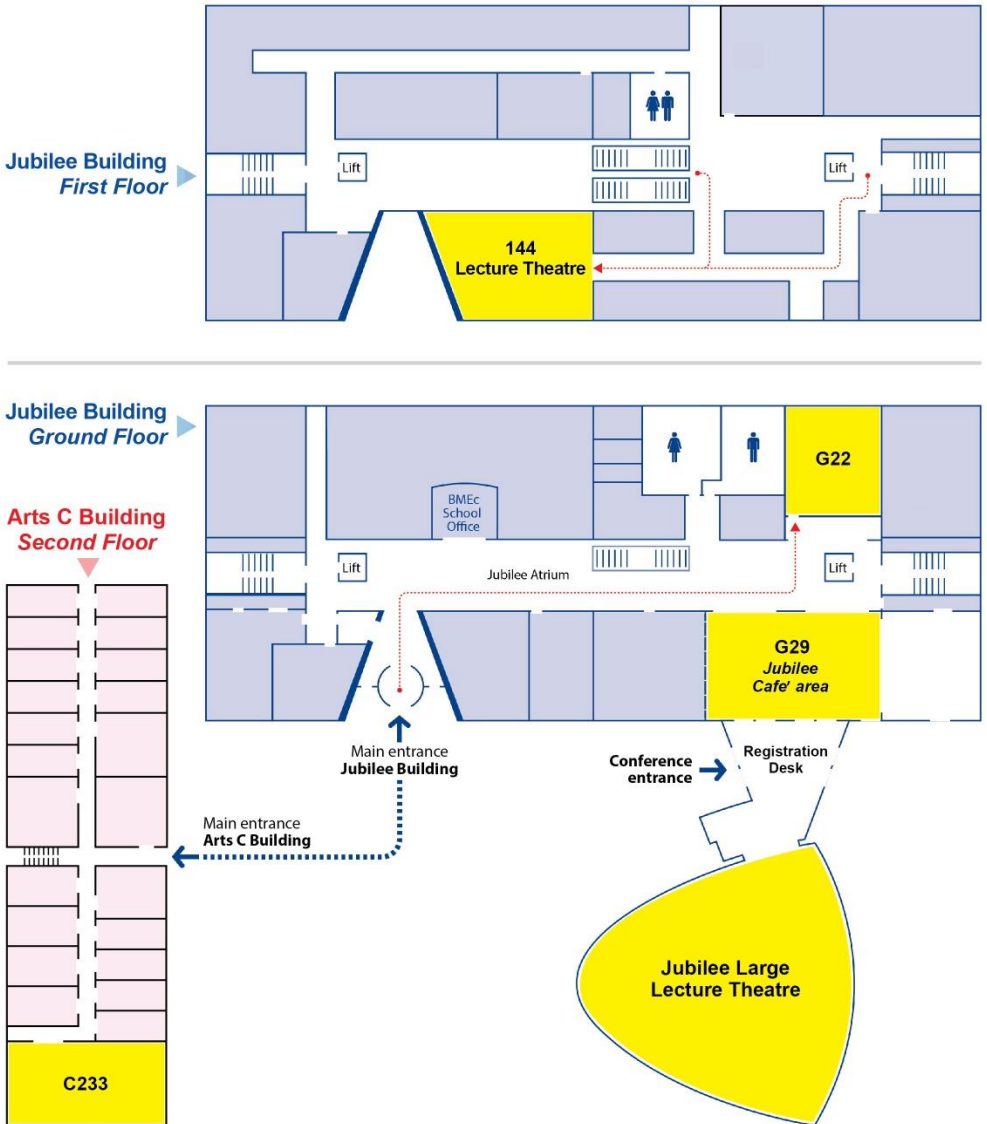
By bus

- The 23, 25, 25X, 28 and 29 buses run between the centre of Brighton and the campus.
- The 25 buses run from Palmeira Square in Hove, through Churchill Square and the Old Steine in Brighton, into the campus.
- The 23 route runs from Brighton Marina in the east, through Hanover, into the campus.
- The 28 and 29 go from Churchill Square and stop outside the University campus.
- Some 5B (Hollingbury) and 50 (Hollingdean) buses also run to the campus.
- Travel time between the campus and Brighton is about 20 minutes.

By car

The university is at Falmer on the A27 between Brighton and Lewes, about four miles (six kilometres) from the centre of Brighton. Follow signs for the University of Sussex, which is on the north side of the A27.

Floor Plan (Jubilee and Arts C Buildings)



All activities within the **Jubilee Building** occur on the ground and first floor. Please use the lift and stairs to access the necessary level. While, in **Arts C Building**, we use room C233 on the second floor only on day 1 (16th May).

Thank you

We would like to thank you all for being part of the SPRU PhD Forum 2019. We greatly appreciate your involvement and contribution and we hope you enjoy the presentations and discussions the Forum offers.

With best wishes

The SPRU PhD Forum Organising Committee

Abeer Aleryani
Arthur Moreira
A-sa Veskijkul
Eleanor Drabik
Franco Ivan Gonzalez Zenteno
Josie Coburn
Nuttapong Nutipanich
Phillippa Groome
Sara Almaged
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