

SCIENCE POLICY RESEARCH UNIT

SPRU PhD Forum
Thursday 17 - Friday 18 May 2018
Jubilee Building, University of Sussex campus, Brighton

'Science, Technology and Innovation for a World in Transition: Interdisciplinary Perspectives'

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
Twitter: @SPRU_Forum

The logo of the University of Sussex, featuring a stylized 'US' monogram.

UNIVERSITY
OF SUSSEX

Welcome to the University of Sussex and the 24th Annual SPRU PhD Forum, 17-18 May 2018

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 2017' 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 'Science, Technology and Innovation for a World in Transition: Interdisciplinary Perspectives' with an emphasis on thinking across disciplinary

boundaries, and connecting and integrating different views and approaches to the challenges faced by our changing world.

The SPRU PhD Forum is a free event that 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:

Plenary Panels: We will open each day with thought-provoking plenary panels on interdisciplinary topics including 'Research Impact' and 'Transformative Policies for Inclusive Structural Change'. These panels will bring together expertise from a range of inspiring academics and also offer you the chance to ask them your questions.

Keynote Speeches: We are delighted and honoured to have Professor Philippe Laredo and Dr Helene Ahlborg joining us this year as our keynote speakers. Professor Laredo will deliver his speech on Thursday morning and Dr Ahlborg will deliver her speech on Friday morning.

PhD Topic Presentations: On Thursday afternoon, we will have a series of themed presentation and discussion tables. Each discussion will be initiated by 5-minute presentations from PhD students on the topic of their research, followed by an opportunity to share in these ideas, discuss them further and to learn from one another.

PhD Panel Presentations: On Friday afternoon, PhD students from a wide range of universities will be presenting their papers. Presentations will be followed by a question and discussion session within a panel format.

For a full list of the Forum's sessions, participants and timings, please refer to the Forum schedule on pages 4 and 5.

Internet and Wireless

Twitter: #Spruforum2018; @SPRU_Forum

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, but if not, follow these instructions to use a temporary username and password.

1. Before you start you will need your login details:

username: spruphdforum@conf.sussex.ac.uk

password: WA9zA6pu

2. Register your device with Sussex

(You only need to do this the first time you connect)

Start by connecting to the Wi-Fi network called sussex.ac.uk-wifi-setup

- Open a browser which should automatically take you to the Sussex registration page (this can take a little while so wait for a minute if it doesn't appear immediately)
- Click on the "GO" button for visitors
- Read and accept the terms and conditions and Sussex Regulations
- Press the "Start" button

Now follow the on-screen instructions to set up your computer to connect to the eduroam network. You will be guided through the process and the settings to enable you to connect will be added to your computer automatically.

Xpress Connect

This process uses a program called "XpressConnect" to automatically configure the settings that your computer needs to connect to the "eduroam" network. This program from CloudPath Networks has been approved and configured by Sussex IT Services.

3. Next time you connect

You only have to follow the set-up process once so next time you connect:

- Select the wi-fi network "eduroam" (the wireless network used at Sussex)
- If you are asked for your username and password, make sure you enter spruphdforum@conf.sussex.ac.uk along with the password.

Programme Schedule

Day 1 – Thursday 17th May 2018		
Time	Activity	Venue
9:00	Delegate Registration	Jubilee Hall
9:40	Welcome Remarks <i>Steve McGuire</i> , Head of BMEc	Jubilee Lecture Theatre
9:50	Plenary Panel Session on Research Impact Chair: <i>Michael Hopkins</i> Speakers: <i>Joanna Chataway, Felix Rehnberg, Barbara Van Dyck</i>	Jubilee Lecture Theatre
11:20	Networking Break	Jubilee 135
11:45	Keynote Speech: Research Impact <i>Philippe Laredo</i>	Jubilee Lecture Theatre
12:45	Networking Lunch	Jubilee 135
13:45	PhD Topic Presentations Table 1: Transitions Towards Environmental Sustainability Chair: <i>Christopher Rogge</i> Speakers: <i>Gianluca Biggi, Ida Sognnaes</i>	Jubilee 118
	Table 2: Energy Policy Chair: <i>Karoline Rogge</i> Speakers: <i>Mareike Lührs</i>	Jubilee G22
14:30	Table 3: Research Perspectives on Innovation 1 Chair: <i>TBC</i> Speakers: <i>Fabien Ibanez, Melina Galdos</i>	Jubilee 118
	Table 4: Economics of Innovation and Industrial Policy Chair: <i>Edgar Salgado</i> Speakers: <i>Esma Akkilic, Alice Ngo</i>	Jubilee G22
15:15	Networking Break	Jubilee 135
15:30	PhD Topic Presentations Table 5: Technology and Innovation Management Chair: <i>Ohid Yaqub</i> Speakers: <i>Oishee Kundu, Mario Gruber</i>	Jubilee 118
	Table 6: Gender and Technology Chair: <i>Helene Ahlborg</i> Speakers: <i>Em O'Sullivan, Victoria Kasprowicz</i>	Jubilee G22
	Table 7: Urban Spaces and Regional Innovation Chair: <i>Roberto Camerani</i> Speakers: <i>Kasturi Hazarika, Jirapan Ymakaew</i>	
16:15	Table 8: Research Perspectives on Innovation 2 Chair: <i>Phil Johnstone</i> Speakers: <i>Anna Ciechomska, Mayra Morales Tirado</i>	Jubilee 118

	Table 9: Industrial Policy and Structural Change Chair: <i>Simone Vannuccini</i> Speakers: <i>Arthur Moreira, Bernardo Caldarola</i>	Jubilee G22
17:00	Closing Remarks <i>Tim Foxon</i> , head of the SPRU doctoral studies	Jubilee Lecture Theatre
18:00	Coach to Brighton and Meal	

Day 2 – Friday 18th May 2018		
Time	Activity	Venue
9:30	Opening Remarks <i>Johan Schot</i> , Head of SPRU	Jubilee 144
10:00	Plenary Panel Session on Transformative Policies for Inclusive Structural Change Chair: <i>Joanna Chataway</i> Speakers: <i>Judith Sutz, Mathias Ramirez, Tommaso Ciarli, Raphael Kaplinski</i>	Jubilee 144
11:45	Networking Break	Jubilee 135
12:00	Keynote Speech: Sustainability Transitions and Locations of Power Chair: <i>Saurabh Arora</i> Speaker: <i>Helene Ahlborg</i>	Jubilee 144
13:00	Networking Lunch	Jubilee 135
14:00	PhD Panel Presentations 1: Energy and Sustainability Chair: <i>Claudia Obando Rodriguez</i> Speakers: <i>Farzana Bardai, Donal Brown, Keija Yang, Nhat Strøm-Andersen</i>	Jubilee 115
	2: Economics of Innovation and Industrial Policy Chair: <i>Filippo Bontadini</i> Speakers: <i>Helena Brennan, Andrea Califano, Sara Valencia, Julian Gregory</i>	Jubilee 118
15:30	Networking Break	Jubilee 135
15:45	PhD Panel Presentations 3: Science, Politics and Decision Making Chair: <i>Joshua Hutton</i> Speakers: <i>Rosalind Attenborough, Anna Severin, Hanh La, Bipahsyee Gosh</i>	Jubilee 115
	4: Technology Management Chair: <i>Martha Bloom</i> Speakers: <i>Vassilis Galanos, YingYin Lin, Sabrina Mistry</i>	Jubilee 118
17:15	Closing Remarks: <i>Joanna Chataway</i>	Jubilee 144

Speakers

Welcome Remarks Day 1: Steve McGuire, Head of BMEc and Professor of Business and Public Policy, University of Sussex

Professor McGuire was previously Director at the School of Management and Business at Aberystwyth University. He also taught at the University of Bath, and in 2009 he was a visiting professor at the College of Europe. He has also taught on degree and executive-development programmes at the Audencia Nantes Management School and the Vlerick Business School. His research interests are in the areas of international political economy, international business and corporate political activity. He has a particular interest in the interaction of firms and governments in international trade, and has published a number of papers on the World Trade Organisation. He has published in, among others: *Annals of Operations Research*; *British Journal of Management*; *Business and Politics*, *International Journal of Management Reviews*; *Management International Review* and *Organization Studies*. His previous research has been funded by the British Academy, the European Union's FP7 programme, the Daiwa Anglo-Japanese Foundation and the Nuffield Foundation. He is currently principal investigator for Sussex on RESPECT, a ten partner study of EU trade policy. He serves on the editorial boards of two journals, *Business and Politics* and *European Journal of International Management*. He is also a member of the ESRC's Peer Review College.

Keynote Speaker Day 1: Philippe Laredo, Directeur de Recherche at Université de Paris-Est (Ecole des Ponts, IFRIS) and professor at the University of Manchester (MBS, Manchester Institute of Innovation Research)

Philippe's research interests are on new emerging sciences and breakthrough innovation and on research and innovation policies. Recent work on the latter focuses on the development of new evaluation approaches for assessing societal impacts of public research, and on the development of 'positioning indicators'. On the latter, he presently coordinates a distributed European research infrastructure supported by the EC, RISIS (2014-2017).

Closing Remarks Day 1: Joanna Chataway, Professor of Science and Technology Policy, SPRU

Joanna has a background in international development and innovation policy. She has worked in high, middle and low income country contexts and across various sectors. In recent years, however, her main focus areas have been health innovation and related policy and inclusive innovation. More broadly, she is keen to further analysis of the political economy of science, technology and innovation policy. Her overall aim is to contribute to evidence and thinking about the ways in which science, technology and

innovation address the health, economic and social needs of low and middle income groups in different contexts.

Welcome Remarks Day 2: Johan Schot, Director of SPRU

Professor Johan Schot joined the University of Sussex as the Director of SPRU – Science Policy Research Unit - in January 2014. He is a Professor in the History of Technology and Sustainability Transitions Studies. His research is wide-ranging but has always focused on integrating social science and historical perspectives for a better understanding of the nature and governance of radical socio-technical change. His current research focuses on Deep Transitions, Transformative Innovation Policy and on the role of Science and Technology in European Integration.

Prior to coming to Sussex, he held academic posts at the Eindhoven University of Technology and the University of Twente, Netherlands. In 2009, Johan Schot was elected to the Royal Netherlands Academy of Arts and Sciences (KNAW) for the genuine interdisciplinarity of his work. He has been heavily involved in the development of innovative new concepts and interpretations, and has co-produced highly cited and influential academic contributions. In 2002 he was awarded a VICI grant by the Netherlands Organization for Scientific Research (NWO). This is a personal award for top-scholars comparable with the ERC Advance Investigator Grant. In 2015 he was awarded the Leonardo da Vinci Medal for his outstanding contributions to the history of technology. In 2016 he founded the Transformative Innovation Policy Consortium. In 2017, a further accolade was received for his work in the History of Technology, with an honorary degree being awarded by the New University of Lisbon, Portugal for his outstanding research and contribution to the field and its development. For more information see www.johanschot.com

Keynote Speaker Day 2: Helene Ahlborg, postdoctoral research fellow at School of Global Studies, Gothenburg University

Helene's research is about rural electrification in East Africa and societal transformation. She studies the co-development of technology and society and how provision of electricity services, based on small-scale renewable energy resources, impacts on people's lives and transforms rural communities. She received her Ph.D. in Environmental Science at Chalmers University of Technology in 2015. Her thesis has the title: "Walking along the lines of power". The studies investigate energy transitions at different levels and scales, from international politics and global scales, to national level policy, down to local level electrification processes as they unfold in people's' lives. Her main research interests concern sociotechnical change, power relations, institutions and cross-cutting dynamics between society-technology-nature, how renewable energy systems impact on life in rural Africa, and how gender and class influence electricity access. Theoretically her work builds on and contributes to debates in the fields of

energy and development, rural development, innovation studies, science and technology, social-ecological systems, feminist theory and power theory.

Closing Remarks Day 2: Tim Foxon, Professor of Sustainability Transitions, SPRU

In addition to his role as Professor of Sustainability Transition, Prof. Foxon became Head of Doctoral Research at SPRU in January this year. His research explores technological and social factors relating to the innovation of new energy technologies, the co-evolution of technologies and institutions for a transition to a sustainable low carbon economy, and relations and interdependencies between energy use and economic growth. His current research focuses on Realising transition pathways to a UK low carbon electricity system (EPSRC), examining business models for local low carbon infrastructure (EPSRC/ESRC), and the relations between energy use and economic growth.

Plenary Panels

Plenary Panel 1: Research Impact

Michael M Hopkins, Senior Lecturer and Director of Research, SPRU

Michael trained initially as a biologist before taking subsequent degrees in Technology and Innovation Management (M.Sc) and Science and Technology Policy (D.Phil). He has more than 15 years experience researching the sociotechnical challenges associated with biomedical innovation. In recent years Michael has led a series of international research projects studying different aspects of the innovation ecosystems that support medical innovation (particularly in pharmaceuticals and diagnostics). He has been supported by EU grants, the NSF, the UK's MRC, EPSRC, ESRC, and Nesta. He enjoys publishing articles and books of relevance to students, academics, policy makers and practitioners.

Joanna Chataway, Professor of Science and Technology Policy, SPRU

(Please see biography above)

Felix Rehnberg, Head of the Research Quality and Impact team, University of Sussex

Felix is Head of the Research Quality and Impact team, and oversees university-wide activities related to impact. Felix has a background in working with university research impact, as well as knowledge transfer in the international context. He has worked in areas ranging from sports science and education to health and virtual reality technology. Prior to working in Higher Education, Felix spent eight years working in Asia in a variety of roles, including working for a Canadian neuroscience start-up heading up their research and industry collaboration activities in Japan and China.

Barbara Van Dyck, Marie Curie Research Fellow, SPRU

Barbara is a Marie Skłodowska Curie Fellow at SPRU and the STEPS-centre. She works on science in society questions with a particular interest in political economies of (agrifood) innovation, civil society engagement on technology and political agroecology. Being trained, and critical towards her education as an engineer in the life sciences, she is particularly curious about the methods of questioning the world in ways that go beyond disciplinary and institutional boundaries.

Plenary Panel 2: Transformative Policies for Inclusive Structural Change

Joanna Chataway, Professor of Science and Technology Policy, SPRU

(Please see biography above)

Judith Sutz, Professor and Academic Coordinator of the University Research Council of the Universidad de la República, Uruguay

Judith Sutz is Full Professor and Academic Coordinator of the University Research Council of the Universidad de la República, Uruguay, where she inaugurated the teaching of science, technology and society. Her research focuses on the specific conditions for innovation in developing countries and with the production and social use of knowledge in such countries, including on the role of universities in knowledge creation and use. She has also worked and done research in Venezuela and France and was an ESRC Visitor to the Innogen Centre in 2009. From 1991 to 1997 she was the Secretary for Science Technology and Development of the Latin American Commission of Social Sciences. She was a Member of the Task Force on Science, Technology and Innovation for the UN Millenium Development Goals Program (2002-2004). She is a member of the World Academy of Arts and Sciences. Presently, she is also President of the Globelics Scientific Board. She has more than 100 publications on subjects that include: science and technology policy, University reform and development, innovation systems in Latin America, social inclusion and inclusive innovation, linkages between bio-innovation knowledge and production in Uruguay, and innovation systems in small countries.

Tommaso Ciarli, Senior Research Fellow, SPRU

Tommaso's main research interests are in the area of technological change, institutional change, and economic development. He is currently involved in several funded projects, including: micro macro models of growth and structural change (EC), the relation between innovation, employment, and inequality (ESRC, JRF), violent conflict and economic activity (ESRC, CEPR and DFID), and the relation between inclusive innovation and structural change (IDRC). He is also revising papers on recently finished projects, among which the political economy of research trajectories in agri technologies (ESRC and NSF). He holds a PhD in Economics and in Industrial Development from the University of Birmingham and the University of Ferrara (Italy). He previously worked as a Researcher at the Max Planck Institute of Economics (2008-2011), as a Postdoc at the Manchester Metropolitan University (2007-2008) and at the University of L'Aquila, Italy

(2006-2007) and teaching at the University of Bologna (2005-2007). Before the PhD Tommaso has worked for UNIDO and ECLAC (2000-2004).

Raphael Kaplinski, Honorary Professor at SPRU, Emeritus Professor at the Institute of Development Studies and at the Open University

Raphael's primary research interests are in Globalisation, Global Value Chains, Inclusive Growth and Inclusive Innovation, the Terms of Trade and the Impact of the Rising Powers (particularly China) on Sub Saharan Africa, publishing extensively in all of these fields. Over the past four decades he has worked with policy makers, the private sector, trades unions and civil society groups.

Mathias Ramirez, Senior Lecturer, SPRU

Much of Mathias' current research activity is related to innovation policy in Latin America where he is coordinating a project funded by the Colombian department of science and technology (Colciencias) on transformative innovation policy. Mathias did his PhD studies at the Manchester School of Management, UMIST (now merged with the University of Manchester), where he looked at the relationship between work organisation and innovation in the telecommunications sector. Mathias then worked as a researcher at Birkbeck College on two projects, the first was an FP7 project related to the impact of globalisation on employment, the second a cross country comparative study of management training and development in Europe funded by the European Leonardo fund. He was hired as a lecturer at Brunel University where he worked between 2003-2007 and led an ESRC project on labour markets, knowledge transfer and innovation in the Zhongguacun science park. In 2007 Mathias joined SPRU at the University of Sussex. His research interests combine topics of knowledge and organisations, but have more recently moved towards questions of Science and Technology Policy in Latin America where he has researched on the relationship between networks and knowledge in agribusiness. He is currently part of the transformative innovation policy consortium with a focus on Colombia and Mexico.

PhD Topic Presentations

Table 1: Transitions Towards Environmental Sustainability

Chair: Christoph Rogge, Research Fellow, the Berlin Social Science Centre, Germany, and visiting scholar at SPRU

- "The temporal geography of the "Dirty Dozen": Gianluca Biggi 1st year PhD student, University of Pisa, Italy
- "Transitional costs in the low carbon transition": Ida Sognaes, 2nd year PhD student, University of Cambridge, UK

Table 2: Energy Policy

Chair: Karoline Rogge, Senior Lecturer in Sustainability Innovation, SPRU

- “Small, modular, and flexible energy systems for future uncertain demand?”: Blanche Ting, 4th year PhD student, SPRU
- “Relocating Energy Strategy: The Emergence of Scottish Energy Policy”: Mareike Lührs, 3rd year PhD student, University of Edinburgh, UK

Table 3: Innovation Research and Perspectives 1

Chair: (TBC)

- “Inclusive innovation in emerging systems of innovation: what can conventional frames’ initiatives tell us about social inclusion”: Melina Galdos, 1st year PhD student, SPRU
- “How to bridge University – Industry cultural differences to perform successfully in Knowledge integration in Knowledge intensive sectors”: Fabien Ibanez, 1st year PhD student, SPRU

Table 4: Economics of Innovation and Industrial Policy

Chair: Edgar Salgado, Research Fellow, SPRU

- “Task-biased technological change and job polarisation: a comparative analysis of job quality change in the USA and the Nordics”: Esmá Akkílic, 1st year PhD student, University of Cambridge, UK
- “Knowledge spillovers within ICT clusters in developing countries”: Alice Ngo, 2nd year PhD student, University of Huddersfield, UK

Table 5: Technology and Innovation Management

Chair: Ohid Yaqub, Senior Lecturer, SPRU

- “Public Procurement and Innovation: A Scoping Review”: Oishee Kundu, 1st year PhD student, University of Manchester, UK
- “Managing Consumer Acceptance of Radical Innovations”: Mario Gruber, 1st year PhD student, King’s College London, UK

Table 6: Gender and Technology

Chair: Helene Ahlborg, postdoctoral research fellow, School of Global Studies, Gothenburg University, Sweden

- “Women and Femmes, Technology, and Makerspaces”: Em O’Sullivan, 2nd year PhD student, University College of London, UK
- “The Gender-Energy Nexus: Appliances as a Proxy for Gender Relations in Guatemala”: Victoria Kasproicz, 1st year PhD student, SPRU

Table 7: Urban Spaces and Regional Innovation

Chair: Roberto Camerani, Research Fellow, SPRU

- “Public Art Projects: For Addressing Critical Concerns of Urban Space and Ecology”: Kasturi Hazarika, 2nd year PhD student, University of York, UK
- “The role of science parks in fostering innovation: the fit between parks, firms and regions”: Jirapan Ymakaew, 1st year PhD student, SPRU

Table 8: Innovation Research and Perspectives 2

Chair: Phil Johnstone (TBC), Research Fellow, SPRU

- “Supporting responsible research and innovation in the EU region”: Anna Ciechomska, 3rd year PhD student, University of Tampere, Finland
- “International mobility as a human creation mechanism. The case of the nanotechnology sector in Mexico”: Mayra Morales Tirado, 3rd year PhD student, University of Manchester, UK

Table 9: Industrial Policy and Structural Change

Chair: Simone Vannuccini, Lecturer in Economics, SPRU

- “Structural change in sub-Saharan Africa: a study on the informal sector”: Bernardo Caldarola, 1st year PhD student, SPRU
- “Embrapa and the role of the Brazilian government in agricultural research, innovation and production in the 1970s”: Arthur Moreira, 1st year PhD student, SPRU

PhD Panel Presentations

1: Energy, Sustainability and Development

Chair: Claudia Obando Rodriguez, 2nd year PhD Student, SPRU

INGOs building education state capacity in Afghanistan, Problems and Prospects

Farzana Bardai, 2nd year PhD student in Education and Social Work, University of Sussex, UK

Capacity development is conceptualized as being crucial to improving sustainable access to quality education in conflict and post conflict states. As such, it is intended to support government actors to be more effective in formulating policies to improve education systems. INGO’s (International Non-Governmental Organizations) play a crucial role in developing government capacities particularly in formulating policy, budgeting, and providing education. Much aid in conflict contexts is spent on supporting INGOs to develop state capacity to rebuild education systems. However, there is limited research

that grapples with education state capacity development in conflict-affected countries by INGOs, (Davies, 2009, p.6).

In this context, the paper draws upon research conducted for a doctoral study that focuses on the role and programs of INGOs working in the education sector to support the capacity development of government officials. This paper aligns itself to the SPRU's Sustainability and Development theme by focusing on the neglected topic of how INGOs support in building state capacity to deliver sustainable access to quality education in conflict contexts.

Drawing on a political economy framework (cf. Davies, (2009, 2011), this paper provides a critical literature review of the role of INGOs in supporting the (re)building the capacity of the Government of Afghanistan's education system. This paper argues that global and local actors influence the implementation of education capacity building programmes by INGOs in Afghanistan. This paper contributes to the understanding of how and why capacity is developed by INGOs in conflict-affect countries, in a globalising context in which the autonomy of the nation state is challenged.

Worth the risk? An evaluation of alternative finance mechanisms for residential retrofit

Donal Brown, 3rd year PhD Student, SPRU

Improving energy efficiency, de-carbonising heat and increasing renewable microgeneration of in existing residential buildings is crucial for meeting social and climate policy objectives. This paper explores the challenges of financing this 'retrofit' activity at scale. 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 and the repayment channel. Combining information from interviews and documentary sources, the paper then explores how these design features influence the success of the finance mechanisms in different contexts. Three outcomes are found to be of particular importance. First, it is shown that a low cost of capital for retrofit finance is critical to the economic viability of deeper, comprehensive 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. However, the political, economic and institutional context of different states strongly affects the type of solutions that are viable. Most importantly the paper discusses how finance alone is unlikely to be a driver of demand for comprehensive residential retrofit, and so instead should be viewed as a necessary component of a much broader strategy.

Regime destabilisation of Chinese electricity system: a perspective of misalignment among different actors

Keija Yang, 2nd year PhD, SPRU

Chinese government has made its commitment to reduce the carbon emissions and reduce GDP carbon intensity by 40-45% in 2020 compared to the 2005 level. To fulfill this ambition, Chinese government has adopted various policies and strategies, for example, to cap the coal power, to increase the proportion of renewables in the energy mix. However, these policies have created tensions among different regime actors, and that tension, as argued by this paper, created opportunities for the unfolding of a transition from the current coal dominated energy system to a system with clean, low-carbon, safety and high efficiency energy.

Existing papers mainly treat regime actors homogeneously by stating that they are easily locked into the established system and there is a necessary of the landscape pressure opens up the regime. However, how did that pressure could be translated into the opportunities for novelties? Especially there are different types of regime actors with different interest, how could they react to or be shaped towards to the novelties? Based on the literature review, and interview data collected from different stakeholders, this paper will unpack the regime destabilisation of Chinese electricity system by treating regime actors heterogeneously.

Sustainability Transitions Towards Bioeconomy: The Role Of Dynamic Interplay Between Technological Innovation, Industry And Policy – An Empirical Evidence From The Norwegian Food Industry

Nhat Strøm-Andersen, 3rd year PhD student at TIK Centre for Technology, Innovation and Culture, Faculty of Social Sciences, University of Oslo, Norway

The topic of my PhD thesis explores the sustainability transition towards an emerging bioeconomy by doing an empirical case study of the Norwegian food industry. More specifically, I study actual and potential value chains and identify sustainable pathways of valorising bio-based resources such as organic wastes, rest raw materials, side streams and by-products. To achieve the research's purpose, my study tackles three main objectives including: (i) studying food waste valorisation value chains; (ii) identifying actors, networks involved and (iii) assessing regulatory frameworks that influence the waste management issue. In other words, it investigates the role of dynamic interplay between technological innovation, strategy and policy in the food industry under the context of sustainability transition. The first paper focuses on investigating what actors play a key role in fostering new knowledge development and transfer in the Norwegian food processing industry as well as what types of knowledge food firms acquire through research collaboration.

The paper contributes to a better understanding of the importance of new knowledge acquisition through networking for firms in a low-tech industry like food (data sources:

surveys, quantitative data from the Norwegian research project bank). The second paper examines how dynamic capabilities affect incumbent firms in respect of engaging in the transition process, and the management strategies adopted in response to external pressures (local and global) and to innovation opportunities (data sources: semi-structured, exploratory interviews). The third paper goes deeper to explore how food firms create higher value for their by-products and side streams resources by making use of technological advancements and developing them further into innovations within the firms by acquiring external knowledge and mobilizing necessary resources (data sources: in-depth interviews for a comparative analysis of a meat and a dairy firm). This paper scrutinizes the role of absorptive capacity in firms' adoption and development of technological innovations. The fourth paper discusses the issue of food waste policy and regulation in Norway by applying the multi-level governance (MLG) framework to comprehend the institutional context in which policy changes emerges. This paper seeks to explain why, despite significant NGO and political mobilization, Norwegian policymakers decided to rely on a non-binding voluntary business self-regulation (data sources: expert interviews and document analysis).

2: Economics of Innovation and Industrial Policy

Chair: Filippo Bontadini, 4th year PhD Student, SPRU

The differences in productivity between EU owned and Domestically owned plants in the North East of England

Helena Brennan, 2nd year PhD Student in Economics, University of Durham, UK

I have been investigating the differences in productivity between domestically owned and EU owned manufacturing plants in the North East of England. With the decision to leave the EU in June 2016, there could be major knock-on effects on the North East Economy. Not only through the levels of exports, 62% of manufacturing exports goes to the EU, but also in terms of the region's productivity levels. It is assumed that foreign-owned plants are more productive than domestically owned plants as they have been able to overcome high sunk costs and successfully compete with the domestically owned plants. There could be a scenario where these EU owned plants choose to relocate or to leave the North East, resulting in job losses and possibly a reduction in the level of productivity. In the North East, manufacturing still employs 11% of the workforce, the second highest percentage in the UK, alongside Northern Ireland, as of September 2017. There is very little, if any, research on the North East of England's current manufacturing industry, and none that I could find examining the differences in productivity between domestically owned and EU owned plants in the North East of England.

Using manufacturing data from 1973 to 2014, I categorised the different industries in the three groups based on their 1980 SIC codes:

- Category 2 includes Extraction of Minerals and ores other than fuels, Manufacturing of Metals, Mineral products and the chemical industry.

- Category 3 includes Metal goods, engineering and vehicle manufacturing
- Category 4 includes all other manufacturing industries, such as the food, drink and tobacco industry, and production of footwear and clothing.

For my model, I generated the time trends and interaction variables between these time trends and plant ownership and estimated my model using system GMM to establish the productivity time trends for EU and domestically owned manufacturing plants in the North East of England. I also estimated the productivity time trends for the South East of England, as these are presumed to be at the, or at the very least near, the productivity frontier.

My findings suggest that EU owned plants in the North East of England have the lowest levels of productivity compared to all other plants in 1973 for all industries. EU plants in the South East also perform worse compared to their domestic counterparts, however, over time end up being more productive than their UK counterparts.

Converging dynamics within the EU: a matter of participation to the Germany-centred production system

Andrea Califano, 3rd year PhD student in Economics and Social Sciences, IUSS Pavia, Italy

The aim of the paper is to present the “relationships between science, technologies and their industrial exploitation” as a potentially useful theoretical framework for better understanding the economic crisis in the European Union, and the connected dynamics of convergence and divergence. At the beginning of the period under observation, Eastern European countries performed worse than the Mediterranean periphery in every single indicator considered. After two decades, the gap between the two groups have narrowed significantly with respect to R&D expenditure, patenting activities and productivity levels; indeed, it has also turned into an advantage of the EEC with respect to the number of total researchers and the share of high-tech exports. Moreover, despite the inevitable process of structural change towards a higher weight of services in the economy, EEC have managed to maintain a significantly high share of manufacturing value added, while in the Mediterranean periphery this figure has progressively fallen. All these elements seem to delineate a clear and univocal pattern: EEC have embarked upon a catch-up process in scientific, technological and productive activities. At the same time, the Mediterranean periphery, despite showing a modest trend of convergence in GDP per capita before the 2007 global financial crisis, has not shown clear evidence of narrowing the gap in innovative and productive capabilities. If anything, the disparity has increased, especially in recent years. The paper argues that the increasing success of the EEC could therefore be explained by their participation to the dynamic German production system (and to the Germany-centred Global Value Chains). This is tested with the use of simple econometric tools. Those countries have developed and organized a considerably strong manufacturing sector which produces mainly intermediate capital goods, later assembled in the core, at much lower costs compared to the southern

periphery. Indeed, the Mediterranean periphery is much less integrated in the German industrial matrix of production.

Biomedical R&D models to develop new drugs in Argentina, Brazil and Colombia

Sara Valencia, 4th year PhD student in Science and Technology Studies, University of Edinburgh, UK

Latin America is home to middle-income countries with some of the fastest-growing economies in the world. Despite their historical leadership on access to medicines, governments in Brazil and Argentina have swung to conservative administrations decreasing public investment in R&D. Nonetheless, investments and policies developed at the beginning of this decade to enhance the productive public infrastructure to produce medicines and biological products are myriad examples of need-driven incremental innovation ongoing in each of these countries. Colombia is another fertile ground to explore and amplify examples of need-driven R&D in a context where does not exist public production of medicines, but there is an evolving research ecosystem, especially in the city of Medellin which has consolidated R&D policy that has pushed the development of need-driven biomedical products. Also in Colombia, it has been notorious the leadership of its Ministry of Health in setting price controls, regulating marketing authorisation of bio-generics and issuing a public interest declaration to decrease medicines prices. In Colombia, the intersection between a growing R&D environment and the interest of the government to increase access to medicines presents a historic opportunity to strengthen local production of biomedical products transforming biomedical R&D to a new level.

This paper presentation addresses key cases of study to inform alternative R&D models to develop new biomedical products driven by peoples' health needs in Colombia, Brazil and Argentina. Each model discussed the actors, incentives, financing mechanism, regulation and any associated strategy for making products publicly accessible. This work analyses the social, economic and political elements that circumscribe and drive the different cases of innovation ongoing in each country. The cases presented are divided into two big categories. In the first category are bottom-up products developed by local researchers which through a series of alliances and/or access to public funded programs have advanced through the stages of a product development, including pre-clinical, clinical and productive phases. The second category correspond to top-down cases in which the government have invested on increasing industrial capability to produce medicines and in turn, incremental innovation has been stimulated. This division allows to evidence from two angles the development of biomedical products and productive capabilities and the potential impact of R&D policies on these activities. The results can inform civil society, policymakers and researchers considering the local dynamics about alternatives to developing new drugs to address people's needs in each one of the countries and at a regional level.

Understanding the private sector's reluctance to invest in sub-Saharan Africa electricity infrastructure

Julian Gregory, 1st year PhD student in Science and Technology Studies, SPRU

Sub-Saharan Africa (excluding SA) is the most electricity deprived region in the world, yet electricity capacity growth rates over the last 40 years have been restricted, being half those found in other developing regions. This lack of electricity access means that much needed economic transformation cannot happen, as affordable and reliable electricity connectivity is regarded as a principal requirement for foreign direct investment (FDI) and economic growth.

Historically, Official Development Assistance (ODA) was used to finance electricity infrastructure development in SSA. Towards the end of the last millennium however, due to a new agenda being set during the Wolfensohn's presidency of the World Bank, there was a shift in expectation that such financing should instead come from the private sector sources. Since then, both senior personnel and policy papers from the World Bank and other respected multilateral organisations, have repeated that the level of financial resource required to end SSA electricity poverty needs to come from the private sector. Despite these constant calls for support, the private sector does not see attractive opportunities associated with SSA electricity infrastructure projects, perceiving them as being both too uncertain financially and reputationally, when compared to alternative investment opportunities.

The academic literature contains a number of theories to explain this private sector reluctance, many of them focused on a lack of 'good governance'. However, a decision to invest is a function of uncertainty and reward, but as revealed through a systematic review carried out in June 2017 by this author, the literature appears to not appreciate the significance of uncertainty in the financing process.

My conference paper intends to utilise three different theoretical frames about electricity governance and their current contribution to uncertainty, to illustrate why the existence of excessive negative uncertainty, created through governance failure is actually the problem, rather than governance itself. These theories surround:

1. Financial governance: the private sector investor's perspective, which focuses on the rules and institutions (or lack of) that directly influence the investment environment in SSA;
2. Political governance: the political economy perspective, which relate to the indirect investment consequences resulting from the way that SSA governments govern.
3. Technology governance: the technology application perspective, which entails how the current electricity delivery regimes, impact investment in electricity infrastructure development in SSA.

This analysis is interdisciplinary and draws on the literature from three academic disciplines: investment finance, international development, and innovation studies.

3: Science, Politics and Decision Making

Chair: Joshua Hutton, 4th year PhD Student at SPRU

Stories from the “open science revolution”: how scientists talk about openness

Rosalind Attenborough, 2nd year PhD student in Science, Technology and Innovation Studies, University of Edinburgh, UK

In recent decades, scientists and other researchers around the world have faced a growing moral-epistemic imperative to be “open” in their work. Open access publishing, open archiving of primary research data, open peer review, and open notebook science are some of many “open science” practices that are gaining salience. Movement towards such practices has often been led from within scientific communities – by scientist-activists and entrepreneurs who see the Internet an opportunity to “open up” and fix seemingly broken aspects of the scientific system. Now, the “open” imperative is also top-down, as funding regimes and institutions increasingly treat open access and open data as mandatory. My work focuses on the people – scientists – whose professional and epistemic worlds are undergoing transformation in this open science “revolution”. While some scientists are the leaders of open movements, the majority are more ambivalent and slow to adopt open practices, forming a “cultural” barrier to openness that is rarely explored in empirical depth. Based on my in-progress PhD data collection – qualitative interviews with (biological) scientists, and open science advocates and policymakers – I will explore the diverse meanings of scientific openness that scientists have constructed before, within, and in tension with open advocacy and policy agendas.

Open Access and Standards of Scientific Quality Control in Scholarly Publishing

Anna Severin, 1st year PhD student at Institute of Social and Preventive Medicine, University of Berne, Switzerland

This research aims to shed light on the question of how the dynamics associated with the transition of scholarly publishing towards open access (OA) affect the standards of scientific quality control in scholarly publishing, and vice versa. The starting point of this research is the decision of the Swiss National Science Foundation (SNSF) to implement an OA policy as of 2020 by which its grantees will be required to make their research results publicly accessible. Like many funders, the SNSF currently faces some reluctance on part of universities, publishers and researchers regarding its policy. This relates to concerns over the quality of OA journals. The starting point for these concerns are claims made that OA publishers might be inclined to accept substandard articles since their income is linearly dependent on the number of papers they publish. In particular, the mushrooming of so-called ‘predatory’ journals discredits OA and hence hampers its implementation.

Despite the relevance of this topic, research into the variation in peer review quality between different types of journals is sparse. This relates to the lack of a validated instrument for assessing review quality. In its absence, authoritative blacklists of predatory OA journals that index fraudulent journals provide guidance for scholars wishing to publish their works. These lists and their underlying criteria, however, are subjective, lack transparency and are biased against OA. The research aims to address this shortcoming. It will do so by, first, assessing the congruence of inclusion criteria between different blacklists as well as between different whitelists of OA journals. Preliminary results indicate that these lists overemphasise the business model of a journal while neglecting its quality control mechanisms – pointing to the need for a tool that helps assessing peer review quality. Having identified this need, this research project will develop such instrument. Doing so requires understanding what the standards for peer review are. Hereto, focus groups with stakeholders of the publishing system will be conducted, exploring their experiences and expectations towards peer review. Findings will be incorporated in the development of a review quality instrument. In a final step, the instrument shall be used to assess whether the quality of peer review varies between OA journals and subscription-based journals.

This research will help understanding the consequences of the OA transition in scientific publishing. Further, it will help communicating OA policies to stakeholders, reduce barriers to implementing OA and hopefully point out and address flaws in current scientific evaluation and reputation mechanisms.

The relation between scientific and technological knowledge in emerging fields: Evidence from DNA Nanoscience and DNA Nanotechnology

Hanh La, 2nd year PhD student at the School of Innovation Sciences, Technical University of Eindhoven, Netherlands

To better understand the relationship and interaction between scientific knowledge and technological knowledge, previous studies mainly focused on observing similarities between these two domains. This paper aims to extend our understanding of this relationship by first looking at the interaction between these domains based on the stylised views of science-push and technology-pull, and then detect their similarities, differences, and potential complementarities on the base of their knowledge content and knowledge structure. Focusing on the emerging field of DNA Nanoscience/Nanotechnology, we employed a novel method called the concept approach, which we combined with text-mining and network analysis, to create a dataset of publications and patents that represent the knowledge stock in both domains. Analysing time patterns, we found that some areas in this knowledge field show patterns that match the stylised views of science-push or technology-pull. Furthermore, the observations on similar and potentially complementary knowledge areas suggest that the co-evolution of both domains is a much more dominant phenomenon.

Imagining a smart transformation – Analysis of official smart city discourses as socio-technical imaginaries for smart urban mobility transformations in India

Bipahsyee Gosh, 4th year PhD student at SPRU

‘Smart cities’ as visions for urban futures have been enthusiastically embraced by planners and policy-makers around the world. In India, the smart city discourse has continued to gain currency since 2014, when the national government launched its “Smart Cities Mission” aiming to create socially inclusive and environmentally sustainable cities. Due to the entanglement of social and technological features in smart city visions, it is useful to view them as socio-technical imaginaries (Jasanoff and Kim 2009). In this paper, we focus on the collective process of imagining of smart transformations in India, manifested in the National Smart City Mission guidelines as well as a city level smart city proposal. We developed a theoretical framework to assess the transformative potential of urban socio-technical imaginaries and applied it for discourse analysis of smart city proposal of New town Kolkata. The ultimate goal is to highlight the politics of imagining smart urban futures and how the imagining process determines who benefits, where the benefits land and who are left behind. This has implications for the sustainability of socio-technical systems that are planned to be transformed through this imaginary. In our analysis, we focus on the proposals for smart mobility systems in the aspiring smart city. The results highlight the importance of decentralisation of mobility governance and ‘registering’ the voice of marginalised people in decision making in order to create smart urban India that is both sustainable and inclusive.

4: Technology and Innovation Management

Chair: Martha Bloom, 2nd year PhD Student at SPRU

The Impact of Expectations in the Formation of Policy Documents Concerned with Artificial Intelligence in the UK, US, and EU: A Preliminary Taxonomy, and an Invitation for Empirical Work

Vassilis Galanos, 1st year PhD student in Science, Technology, and Innovation Studies, University of Edinburgh, UK

Previous scholarly work from the field of philosophy of technology has reviewed the three policy documents published respectively by the UK, US, and EU with regard to governmental strategies developed in the light of advanced artificial intelligence. While this work examines the documents from a philosophical, more specifically ethical, lens, I suggest to complement their analysis from a Science and Technology Studies (STS) examination of the role of expectations played in their formation. The field known as the Sociology of Expectations (SoE), so far, focuses chiefly on the way different types of future expectations create self-fulfilling prophecies or promise-requirement cycles, thus shaping technical/scientific decision-making of the present. After reviewing through the prism of the SoE the history of expectations in artificial intelligence (AI) and robotics, I propose that it is possible to model a taxonomy for these fields. More specifically, several

oddly extreme future images appear to co-create the sociotechnical landscape of AI, images such as (a) very positive industry analytics and (b) very negative singularity arguments, further fuelled by science fiction and mythological narratives and imaginaries. At the same time, such images further shape the construction of what I denote, for lack of a better term, (c) functional expectations, that is, standards according to which intelligent systems are “expected” to function, such as Asimov's Laws and the Uncanny Valley. The present paper explores these expectations, highlights their infiltration into the policy documents and shows how the single common aspect of all the documents and expectations: the great absence of expectations generated by researchers and designers of the technologies. These rather (d) empirical expectations (the final part of the taxonomy), built after experiments and interviews with AI experts and roboticists are reviewed and presented as a point of departure, calling for more empirical investigation of the theme.

Institutional framework and emergence of digital industries- A comparative analysis of digital games industry in China and Taiwan

Ying Yin Lin, 3rd year PhD student at King's Business College, University College of London, UK

Existing studies have discussed how latecomers succeed in achieving industry leadership. However, they tend to focus on traditional sectors involving physical components whereas digital sectors have largely been ignored. We seek to explore how latecomers develop innovation capabilities to facilitate their competitiveness in these sectors. Drawing on China and Taiwan's digital games industries, we extend the literature on complementary assets by arguing that successful catch-up requires cross-sectoral knowledge and skills transfer, and that these transfers can compensate for the innate lack of technological capability. We also demonstrate how harnessing networks to access various channels and policy can aid in achieving industrial and capability building.

Capturing value from innovation collaboration through Contracts and Governance

Sabrina Mistry, 3rd year PhD student at King's Business College, University College of London, UK

Collaboration for innovation is a prominent activity for firms that acknowledge the diverse spread of knowledge and resources in the economy. At the heart is the ‘the paradox of openness’ phenomenon, where collaborators understand reciprocity of knowledge sharing, but also wish to protect their knowledge for competitiveness. This qualitative study explores the dynamics of innovation collaboration in the UK biopharmaceutical sector, which intensifies the paradox dilemma. We advance the concept of ‘braiding’ (Gilson et al. 2009), which suggests that formal and relational governance mechanisms are weaved to manage such collaborations, since the contracts are ‘incomplete’ by design. This paper looks at the collaboration timeline, and more particularly, how formal and relational governance mechanisms interact and evolve throughout the collaboration process, answering the call from Zobel et al. (2017). Our findings illustrate how different

'types' of collaborators lead to the evolution of braiding during the collaboration yet have similar features when initiating the collaboration. The study has both practical and theoretical implications about how innovation collaborations are managed, and how value can be captured, and its extent impeded, through various braiding structures adopted.

Thank you

We would like to thank you all for being part of the SPRU PhD Forum 2018. 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

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Useful Information

How to get to the University of Sussex

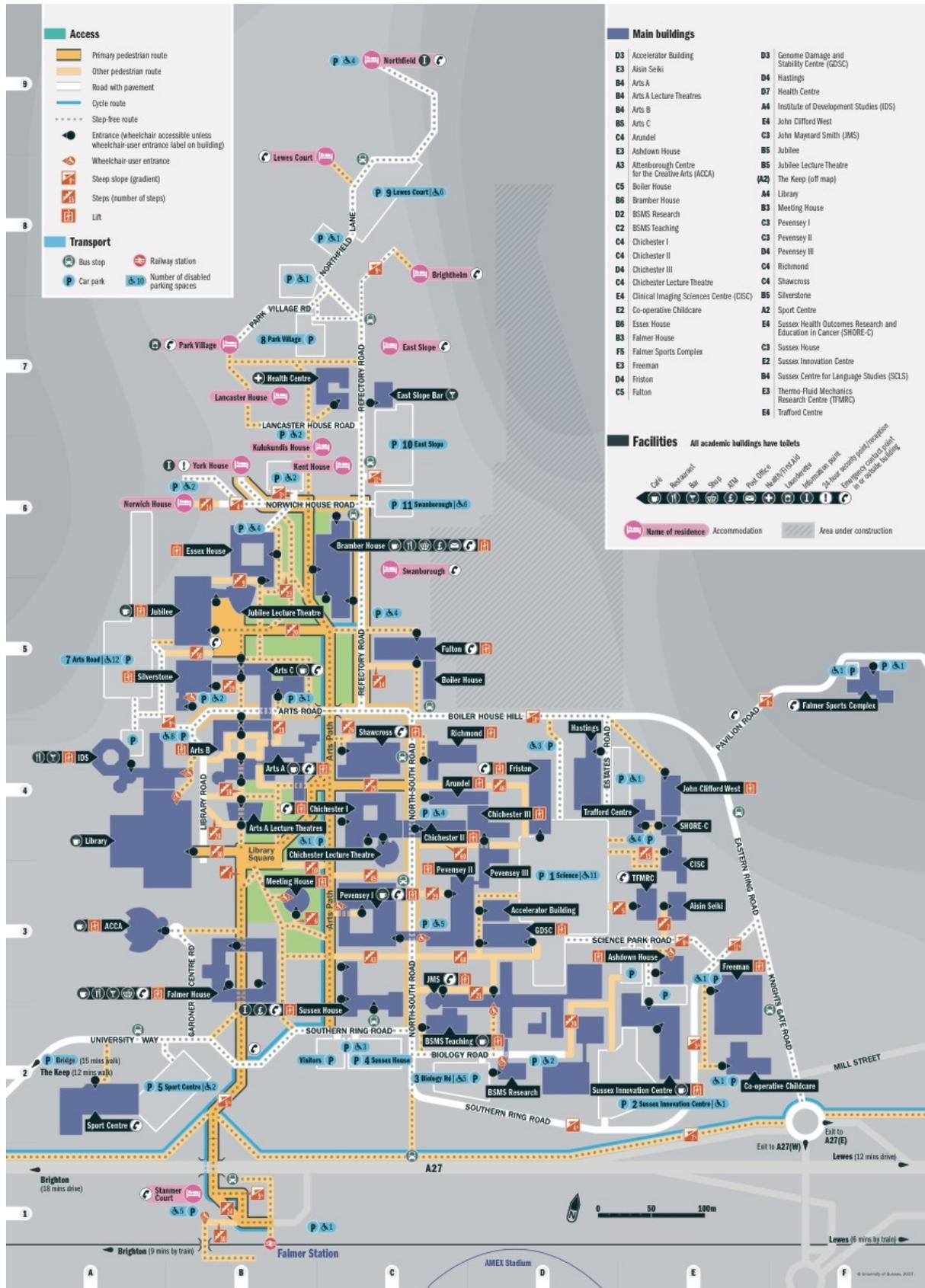
Train

- 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.

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.

Campus Map



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