

SPRU  
50TH ANNIVERSARY CONFERENCE  
7-9 SEPTEMBER 2016



# Transforming innovation

US  
UNIVERSITY  
OF SUSSEX

## PROGRAMME OVERVIEW

### WEDNESDAY 7 SEPTEMBER

**09.00–09.30** • Tea and coffee

**09.30–10.30**

#### OPENING SESSION

Research and policy agenda for a world in transition

**10.30–11.30**

#### CHRIS FREEMAN ANNIVERSARY LECTURE

Creativity, change and constraints: the profound influence of Chris Freeman

**11.30–11.50** • Break

**11.50–12.50**

#### PANEL 1

Energy systems in an uncertain world

**12.50–13.45** • Lunch

**13.45–14.45**

#### PANEL 2

'Racing with the machine': Tensions and trade-offs between technology, innovation and employment

**14.45–15.00** • Break

**15.00–16.30**

#### POLICY DIALOGUE SESSIONS

**16.30–16.40** • Break

**16.40–17.15**

#### FINAL PLENARY SESSION

**17.15–18.00**

Drinks reception

### THURSDAY 8 SEPTEMBER

**09.00–10.30**

#### PARALLEL SESSION 1

**10.30–11.00** • Break

**11.00–12.30**

#### PARALLEL SESSION 2

**12.30–13.30** • Lunch

**13.30–14.15**

#### PANEL 3

Rethinking society for the 21st century: Developing a science and technology studies perspective

**14.20–15.20**

#### PARALLEL SESSION 3

**15.20–15.45** • Break

**15.45–16.45**

#### PARALLEL SESSION 4

**16.50–18.20**

#### PARALLEL SESSION 5

**18.20–18.45** • Buses to evening venue: Brighton Dome

**19.00** • Drinks reception

**19.30** • Gala dinner at Brighton Dome

**21.00** • Evening entertainment

### FRIDAY 9 SEPTEMBER

**09.00–10.30**

#### PANEL 4

Economic policy for innovation and development in Latin America

**10.30–11.00** • Break

**11.00–12.30**

#### PARALLEL SESSION 6

**12.30–13.30** • Lunch

**13.30–15.00**

#### PARALLEL SESSION 7

**15.00–15.30** • Break

**15.30–17.00**

#### PARALLEL SESSION 8

**17.00–18.00**

OUT OF THE BOX  
AND INTO THE FUTURE:  
SUMMARY SESSION

Every effort has been made to ensure that the information presented in this brochure is correct at the time of going to print. The University cannot be held responsible for any errors and/or omissions.

With thanks to the members of the programme committee for their input and support, and to the organisational team – without whose dedicated work this conference wouldn't take place.

**Programme committee members:** Johan Schot (Chair), Lucy Baker, Tommaso Ciarli, Emily Cox, Tim Foxon, Ralitsa Hiteva, Josh Siepel, Benjamin Sovacool and Ed Steinmueller.

**Organisational team:** Nora Blascok, Pip Bolton, Katherine Davies, Charlotte Humma and Sarah Schepers.

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## DETAILED SESSION PROGRAMME

Wednesday 7 September	13
Thursday 8 September	14–18
Friday 9 September	19–21
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The Christopher Freeman Trust was established by colleagues, friends and family members, to preserve Chris's legacy and to place his wide contributions to human knowledge and understanding at the disposal of future generations.

Our website at [► freemanchris.org](http://freemanchris.org) bears witness to the affection and respect in which he was held. It is also a place where we hope memories of Chris will live side by side with a record of his writings, where it can be freely accessed.

A complete list of his publications is on the site ([► freemanchris.org/publications](http://freemanchris.org/publications)) and the University of Sussex has taken the first step towards making his unpublished work available to scholars and historians by lodging it with The Keep, an archive maintained by the University.

We have much work in front of us. We aim to place as many of Chris' works in the public domain as we can, which includes indexing the archives so that the relevant parts can be scanned, uploading his published works to the site, producing a Chris Freeman reader to be published next year, and arranging regular commemorative events.

If you would like to know more, or to help us by adding your memories, thoughts, photographs or other items to the site – especially works that may not have been recorded on the site – please get in touch and, as with any organisation that subsists on voluntary labour, donations are more than welcome.

We can be contacted via the site or by writing to the secretary, Alan Freeman, at [afreeman@iwgvt.org](mailto:afreeman@iwgvt.org)



# Welcome to SPRU's 50th Anniversary Conference

Over 50 years, the Science Policy Research Unit (SPRU) at the University of Sussex has developed a reputation as a leading academic centre at the forefront of thinking on science, technology and innovation. SPRU has been – and continues to be – home to many eminent scholars; our anniversary is testimony to the quality of our staff, their research and teaching.

Since the 1980s, SPRU has run its own Masters courses, offering the first and most comprehensive introduction to Science and Technology Policy with our so-named MSc, and a doctoral research programme, teaching over 1000 students at Masters level alongside supervising over 350 PhD theses. Today, our alumni can be found on every continent. In our 50th year we have launched a new scholarship programme to enable the very best students from around the world to study a Masters at SPRU, funded by alumni and friends who share our vision of science, technology and innovation policy for transformative change.

At the same time that we celebrate this significant milestone for our organisation, we see that the world is facing an increasing number of crises and persistent problems. The modern way of provisioning our basic needs is not sustainable in the long run, and is already causing climate change, profound societal turmoil, tensions and conflict on an unprecedented scale. It is clear that we cannot globalise our current ways of providing food, energy, mobility, healthcare and water.

Looking ahead to the next 50 years, I believe that science, technology and innovation are vital to the future of our economy, environment and societal prosperity. Of course, innovation is not always positive; some forms of innovation have played a role in creating the problems we need to deal with today. Representing the need for a new approach to innovation policy, the theme for SPRU's 50th Anniversary Conference is 'Transforming Innovation'.

SPRU has embarked on an ambitious new strategy focused on long-term transformative change and innovation across different sectors, societies and structures. The work is focused on two primary aspects: the potential for innovation to radically reconfigure the entire economy and society, and the associated need to transform processes of innovation governance.

This conference is an opportunity to explore the nature, determinants and direction of innovation and its contribution to meeting current and future global challenges. Responding effectively to these interconnected challenges requires a fundamental rethink of how we organise, govern, direct and accelerate innovation so that it contributes to long-term sustainable development, economic progress and social justice. I hope that this conference will carry us along this path of discovery as we share and deepen our knowledge, develop collaborations and investigate new possibilities.

Across his entire career, SPRU's founder Chris Freeman embraced an 'economics of hope' – a principle which embodies a positive view of our potential to direct innovation, creativity and new technologies towards more sustainable and inclusive futures. It is my hope that this conference and the transformation of innovation will be conducted in this spirit. I hope that you will enjoy it.

Best wishes,  
**Johan Schot**



**Johan Schot**  
Professor in the History of Technology and Sustainability Transitions Studies,  
Director of SPRU – Science Policy Research Unit,  
University of Sussex



# Chris Freeman Anniversary Lecture

## CHRIS FREEMAN ANNIVERSARY LECTURE

### CREATIVITY, CHANGE AND CONSTRAINTS: THE PROFOUND INFLUENCE OF CHRIS FREEMAN

KEYNOTE SPEAKER:  
PROFESSOR LORD NICHOLAS  
STERN

WEDNESDAY 7 SEPTEMBER  
10.30–11.30

Chris Freeman studied and wrote about economic change as an economic historian, statistician and economist. He focused on innovation and changing technology. Chris sought to understand the nature of and mechanisms driving technological change and, in so doing, he paid close attention to the roles of institutions, economic structures and organisations. He was also path-breaking in the building of protocols for data on concepts which were inherently hard to measure.

At the time Chris was working on his magnum opus, 'The economics of industrial innovation', the economics profession was paying only limited attention to the fundamental issues Chris was raising. However, some of the great economists of the time, such as Ken Arrow, were concerned with the questions Chris was asking and Ken, who was at the heart of much of the early formal theoretical work on innovation, recognises clearly Chris's influence on his thinking.

In the last twenty years or so the profession has become much more deeply involved in the issues that Chris raised, as we see for example in the resurgence of institutional economics (e.g. Acemoglu, Besley), the examination of structural issues (e.g. Rodrik) and the process of entrepreneurship (e.g. Aghion). Schumpeter, always a guiding light for Chris, has moved back to centre stage.

Hence Chris was a prescient voice and his work is being rediscovered and increasingly appreciated for its depth and inspiration. The first part of the talk will briefly chart these intellectual strands. It might seem odd to those outside the economics profession that Chris' focus on change was unusual at the time because the questions he was asking were so clearly fundamental. But this was, in large measure, how it happened.

The second part of the talk will describe how Chris's ideas have influenced my own work in two areas that have been central to my research. The first of these is climate change.

A responsible and wise response to climate change requires fundamental and speedy innovation and rapid change in economic structures, across and within industries, in towns and cities and in the countryside and forests. There is an intense urgency for such change which is not sufficiently widely and deeply understood. The carbon constraints which bind so intensely now if we are to avoid climate change, and the dangers of lock-in of dirty infrastructure, require policies which must foster very rapid change. To guide that change we require a broad and dynamic public economics, as opposed to the often narrow and essentially static analytical approaches which are so common

in much of formal policy analysis. Hence the importance, central to Chris's work, of understanding how change occurs.

Unless we have some understanding of the processes we cannot understand how to influence them.

The second example is very micro: the village of Palanpur in North India that my colleagues and I have been studying for more than four decades and on which we have very detailed household data covering seven decades. Changing land institutions in the 1950s fostered agricultural investment in the decades that followed, embodying real innovation for the villagers. More recently, changing communications have made involvement in the outside economy much more feasible. Living standards have risen, although more slowly than in India as a whole. Income distribution and social mobility, central to Chris's concerns have been changing in fascinating and important ways. The talk will examine how Chris's ideas can help understand this micro, but very informative, example of economic development.

These examples, drawn from my own research experiences, are illustrations of the potential power of Chris's ideas. Others at this gathering papers will surely provide further examples of the long and deep reach of his work.

**Professor Lord Nicholas Stern**

**PROFESSOR LORD NICHOLAS STERN**

Lord Stern is IG Patel Professor of Economics and Government at London School of Economics, Head of its India Observatory, and is Chairman of the Grantham Research Institute on Climate Change and the Environment. He is President of the British Academy (from July 2013), and was elected Fellow of the Royal Society (June 2014). He has held previous posts at universities in the UK and abroad. He was Chief Economist at both the World Bank, 2000-2003, and the European Bank for Reconstruction and Development, 1994-1999.

Lord Stern was Head of the UK Government Economic Service 2003-7, and produced the landmark *Stern Review on the Economics of Climate Change*. He was knighted for services to economics in 2004 and made a cross-bench life peer as Baron Stern of Brentford in 2007. His most recent book is *Why are We Waiting? The Logic, Urgency and Promise of Tackling Climate Change*.



“A responsible and wise response to climate change requires fundamental and speedy innovation and rapid change in economic structures, across and within industries, in towns and cities and in the countryside and forests.”

# Panels and plenaries in the Jubilee Lecture Theatre

WEDNESDAY 7 SEPTEMBER  
09.30–10.30

## RESEARCH AND POLICY AGENDA FOR A WORLD IN TRANSITION

Welcome by Paul Nightingale and  
Michael Davies, University of Sussex

Rethinking innovation policy is timely. Many research councils, governments and international organisations around the world look to innovation to address a number of societal or grand challenges. Yet how to design, implement and govern challenge-led innovation policies is far from clear. Many innovation policies are still based on the 20th century supply-driven innovation model, which takes competition between nations and support for R&D as the main entry point for policy making, without thinking more creatively about the broader suite of innovation policies available. Over recent decades two main innovation policy frames have been developed which might be referred to as R&D and regulation, and national systems of innovation. This session will explore whether we need a third frame that focuses on mobilising the power of innovation to address a wide range of societal challenges including inequality, unemployment and climate change. This frame broadens the concept of innovation and focuses on the directions and choices implicated in socio-technical change. The session will introduce the Innovation Policy for Transformative Change Consortium which aims to explore the future of innovation policy – its foundation, formulation and governance.

### Speaker:

Johan Schot, SPRU

WEDNESDAY 7 SEPTEMBER  
11.50–12.50

### PANEL 1

#### Energy systems in an uncertain world

Energy underpins every facet of economic and social activity, and profoundly influences economic development, international security and environmental sustainability. But to avoid dangerous climate change, global energy systems must rapidly move away from fossil fuels while at the same time supporting a growing population and extending the benefits of industrial society worldwide. Energy systems are currently experiencing unprecedented rates of change, repeated disruptions and increased uncertainty. Prices are volatile, concerns about security and affordability are increasing, tensions between environmental and other objectives are becoming more acute, new technologies are stimulating far reaching system changes and the geopolitical landscape is becoming ever more complex – with a distracted Europe, tensions in the Middle East, an economically vulnerable China, and a nervous Russia. Understanding how best to navigate these complex shifts, whilst at the same time delivering innovative and sustainable energy solutions to a more price-conscious market is a difficult balancing act for today's policy makers. This plenary session will examine these challenges and offer some insights for managing energy systems in today's uncertain world.

### Panellists:

Jim Watson, SPRU  
Kelly Sims Gallagher, Office of Science and Technology Policy, USA  
Wolfgang Eichhammer, Fraunhofer Institute for Systems and Innovation Research ISI

WEDNESDAY 7 SEPTEMBER  
13.45–14.45

### PANEL 2

#### 'Racing with the machine': Tensions and trade-offs between technology, innovation and employment

Recent research concluded that nearly half of all existing jobs in the US are at risk over the next decade or so, thanks to labour-saving technologies affecting low- to medium-skill sectors. Meanwhile, structural shifts in the global workforce have seen much manufacturing move to emerging economies, whilst the tech-boom has fuelled new employment opportunities in the creative and innovative industries, including web and app development roles as well as more general computer support. Globalisation, innovation and technology are changing the nature of the workforce, but is it all bad? Does innovation necessarily cause unemployment, or are we too slow to adapt to structural shifts around the nature of work? Has the 'innovation community' been engaged enough in these debates, and how can we better harness these shifts to enable more inclusive innovation policy?

### Panellists:

Mariana Mazzucato, SPRU  
Giovani Dosi, Scuola Superiore Sant'Anna  
Luc Soete, UNU-MERIT  
Izabella Kaminska, *Financial Times*



**WEDNESDAY 7 SEPTEMBER  
16.40–17.15**

**DAY 1  
FINAL PLENARY SESSION**

Each speaker will reflect on the day's sessions, drawing out conclusions for the conference and providing comments on the future agenda for science, technology and innovation policy

**Panellists:**

Carlota Perez, SPRU / LSE  
Xue Lan, School of Public Policy and Management, Tsinghua University  
Dick Nelson, Columbia University

In the final chapter the report will discuss the contribution of social sciences to policy and institutional change. The Panel claims that it has no partisan political agenda, but aims at restoring hope in social progress and stimulating intellectual and public debates. This plenary panel session and the follow-up parallel session will contribute to that debate. The report itself will be available for comments before the conference.

**Chair:**

Judith Sutz, Universidad de la Republica

**Panellists:**

Phil Scranton, Rutgers University  
Sheila Jasanoff, Harvard Kennedy School  
Johan Schot, SPRU  
Andy Stirling, SPRU

they hope to discuss where the practical hurdles for more effective application currently lie, and identify promising points of leverage that could allow for a closer integration of innovation research into sustainable development in South America.

**Short welcome and introduction:**

Mariana Mazzucato, SPRU, on Future SPRU strategy in Latin America (IADB sponsored)

**Chair:**

Jose Miguel Benavente, IADB Brazil

**Speakers:**

Jorge Katz, University of Chile  
Joao Ferraz, Federal University of Rio de Janeiro  
Mario Cimoli, United Nations Commission for Latin America/ECLAC Chile

**Respondents:**

Carlota Perez and Martin Bell, SPRU

**THURSDAY 8 SEPTEMBER  
13.30–14.15**

**PANEL 3  
Rethinking society for the 21st century:  
Developing a science and technology  
studies perspective**

A large group of science, technology and innovation studies scholars is making a significant contribution to the report *Rethinking Society for the 21st Century*, produced by the International Panel on Social Progress. The Panel seeks to answer the question: Can we hope for a better society in the very challenging context of a series of system crises, growing inequality and climate change? To answer this question the IPSP has mobilised hundreds of social scientists (including economists) to provide answers and to deliver a report. It will address major issues, including: Social Justice, Inequality, Cities, Jobs, Markets, Finance, Corporations, Democracy, Sexuality, Violence, Wars, Peace and Security, and Multiple Directions of Social Progress.

**FRIDAY 9 SEPTEMBER  
09.00–10.30**

**PANEL 4  
Economic policy for innovation and  
development in Latin America**

This dialogue session brings together leading decision-makers and academics with first-hand experience in fostering innovation in four major South American countries. They will talk about the lessons we can draw from these experiences and to provide their perspectives on the innovation-in-development agendas that are emerging on a national and regional level. The Science, Technology and Innovation agendas of all four countries have been greatly influenced by SPRU's thinking over the past few decades; this dialogue session offers an opportunity for some of the key actors in this process to jointly reflect on how SPRU's thinking translates into action in diverse developing country contexts. In particular,

**FRIDAY 9 SEPTEMBER  
17.00–18.00**

**OUT OF THE BOX AND INTO  
THE FUTURE: SUMMARY  
SESSION**

This closing session, created and led by current and former SPRU PhD students, uses multiple media forms to wrap up the conference. We take a look at the key themes and messages from the three days of presentations and discussions, and also look forward at what the future might hold for research and for science and technology for social needs. Trust us, we're not yet doctors...

**Presenter:**

Cian O'Donovan, SPRU

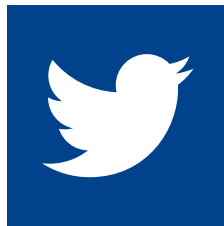
## Stay connected



### CONNECTIVITY

The Conference's network is available throughout the campus and requires no authentication apart from a password.

The password for the duration of the conference is: **untie noisily one riddle** (we don't choose these, they are system generated and sometimes so random it's embarrassing!).



### TWITTER

Been to a ground-breaking session?  
Heard an outrageous proposal?  
Enjoyed a great chat?

Please join the conversation about the conference on Twitter: **#SPRU50**

For live tweets at plenary sessions and general updates, follow: **@SPRU**

### COMMEMORATIVE VIDEO – 50 YEARS OF SPRU IN 50 SECONDS

During lunch on Wednesday and Friday, all participants have the opportunity to provide a very short (50 seconds) reflection on SPRU. The camera will be moving through the Jubilee Atrium but you can present yourself at the registration desk too if you would like to be involved. A selection of these video messages will be published on SPRU's website as part of a collection of materials commemorating SPRU's 50th Anniversary. Please do take part, whether you are a SPRU alumnus or aficionado of STI policy more generally.

### FEEDBACK FOR THE CLOSING SESSION

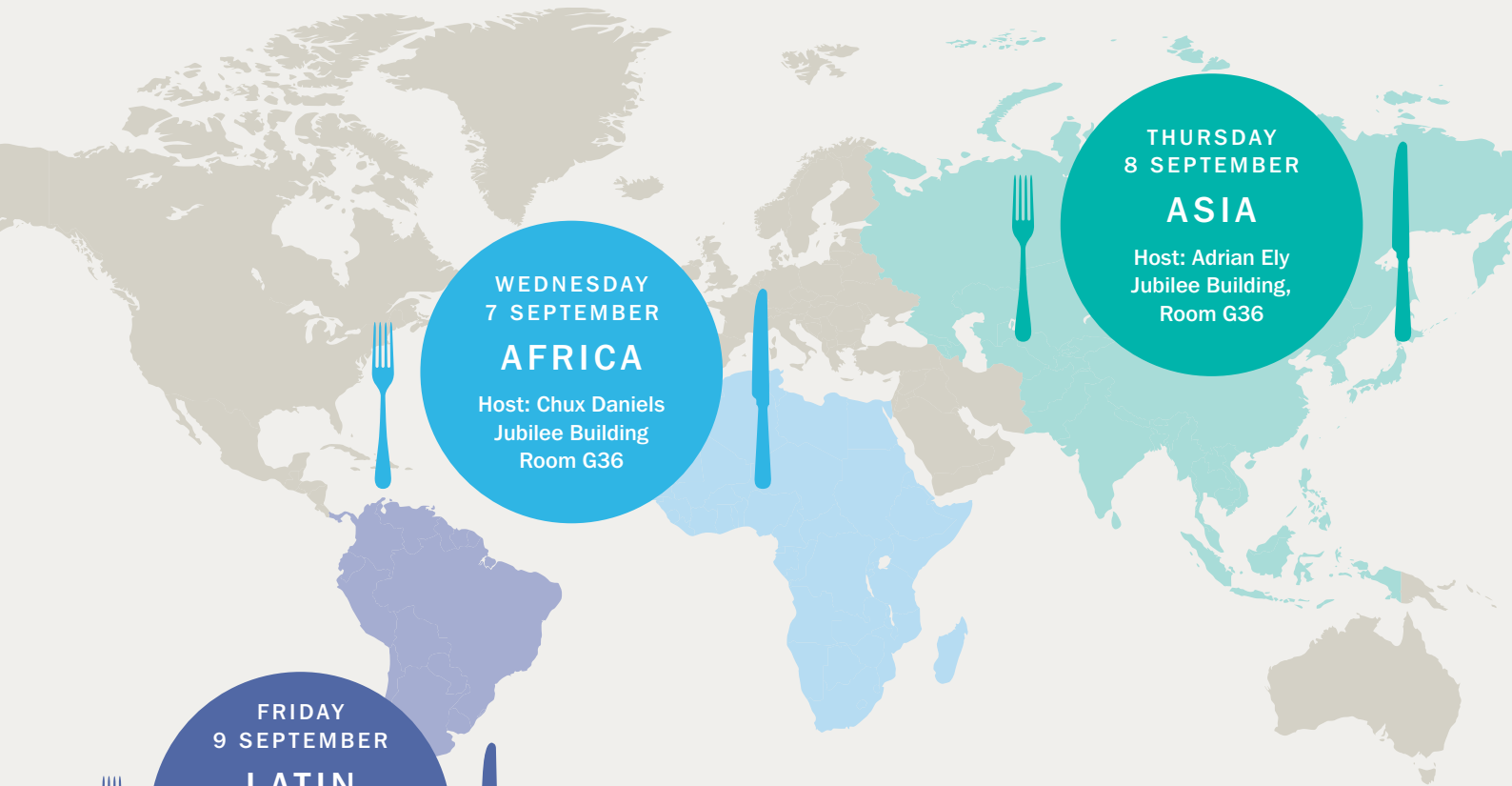
A variety of activities will take place throughout the conference with the aim of obtaining participant feedback on the conference themes and specific sessions. Using different methods and media, SPRU PhD students will present your feedback in the closing session. On the first day you will be asked to complete a short questionnaire, and on the second day you may be asked to give us some of your impressions on camera.

Throughout your stay you will be able to help co-create a wall-based timeline of innovations that have left a mark in recent history.

Please do participate in these activities when you get the chance!

Join us a series of themed lunches served in the Atrium of the Jubilee Building.

On each day there is a dedicated room providing a special opportunity for networking with SPRU faculty, alumni, partners and all conference participants who are interested to find out about SPRU's work in the region of focus and discuss current science, technology and innovation issues. There is also a special lunch for all those interested in infrastructure.



WEDNESDAY  
7 SEPTEMBER  
**AFRICA**  
Host: Chux Daniels  
Jubilee Building  
Room G36

THURSDAY  
8 SEPTEMBER  
**ASIA**  
Host: Adrian Ely  
Jubilee Building,  
Room G36

FRIDAY  
9 SEPTEMBER  
**LATIN AMERICA**  
Host: Matias Ramirez  
Jubilee Building  
Room G36

THURSDAY  
8 SEPTEMBER  
**INFRASTRUCTURE**  
Host: Ralitsa Hiteva  
Jubilee Building, Room 135  
Join a networking event with 3–4 interventions from key people working in the area. Hosted by infrastructure experts at SPRU.



# Gala Dinner

## Thursday 8 September

Venue:  
Brighton Dome Corn Exchange,  
Church Street, Brighton, BN1 1UE

Drinks reception:  
19.00

Dinner:  
19.30

Carriages:  
23.30

### Transportation

Private buses will be stationed outside Bramber House from 18.20–18.45 to take delegates to the Gala dinner venue. Buses will depart as soon as they are full with the last bus departing promptly at 18.45. Delegates who wish to make their own way to the venue are more than welcome to do so.

Those wishing to return to the University will be able to travel back to campus accommodation on a private bus, departing at 23.30 from outside the Corn Exchange.

## POLICY DIALOGUE SESSIONS

<b>A</b> <b>Transforming innovation from below? Grassroots action for sustainable developments</b> Jubilee 144	<b>B</b> <b>STI in the United Nations: historical reflections and lessons for the Sustainable Development Goals</b> Fulton 104	<b>C</b> <b>50 years of nuclear policy research: reflections on the history and prospects of atomic energy</b> Jubilee 115	<b>D</b> <b>Policy mixes for innovation: Progress and challenges ahead</b> Fulton 202	<b>E</b> <b>Rethinking pharmaceutical innovation: New models for more efficient R&amp;D and improved patient access</b> Jubilee 155
<b>F</b> <b>Governing national and international science, technology and innovation efforts for the grand challenges</b> Fulton 203	<b>G</b> <b>The impact of innovation on society: reflections on the clash between intellectual property rights and human rights' protection</b> Jubilee G22	<b>H</b> <b>Entrepreneurship, policy and industrial dynamics</b> Fulton 107	<b>I</b> <b>Challenges of research impact assessment for addressing societal challenges</b> Jubilee 116	

**A** • Jubilee 144

### DIALOGUE SESSION:

**Transforming innovation from below? Grassroots action for sustainable developments**

Organiser: Adrian Smith  
Chair: Adrian Smith  
Panellists: Judith Sutz, Amber Meikle, Dinesh Abrol, Mariano Fressoli

**B** • Fulton 104

### DIALOGUE SESSION:

**STI in the United Nations: historical reflections and lessons for the Sustainable Development Goals**

Organiser: Adrian Ely  
Chair: Adrian Ely  
Panellists: Geoff Oldham, Dong Wu, Elenita 'Neth' Daño, Joanna Chataway

**C** • Jubilee 115

### DIALOGUE SESSION:

**50 years of nuclear policy research: reflections on the history and prospects of atomic energy**

Organiser: Phil Johnstone  
Chair: Phil Johnstone  
Panellists: Gordon MacKerron, William Walker, Steve Thomas, Bill Nuttall

**D** • Fulton 202

### DIALOGUE SESSION:

**Policy mixes for innovation: Progress and challenges ahead**

Organisers: Karoline Rogge, Florian Kern  
Chair: Florian Kern  
Panellists: Rainer Quitzow, Karoline Rogge, Kieron Flanagan, Michael Keenan, Keith Sequeira

**E** • Jubilee 155

### DIALOGUE SESSION:

**Rethinking pharmaceutical innovation: New models for more efficient R&D and improved patient access**

Organisers: Mariana Mazzucato, Michael Hopkins  
Chair: Michael Hopkins  
Panellists: Jack Scannell, Adrian Towse, Els Torreale, Mariana Mazzucato, Luigi Orsenigo

**F** • Fulton 203

### DIALOGUE SESSION:

**Governing national and international science, technology and innovation efforts for the grand challenges**

Organiser: Andreas Stamm  
Chair: Andreas Stamm  
Panellists: Keith Smith, Wolfgang Polt

**G** • Jubilee G22

### DIALOGUE SESSION:

**The impact of innovation on society: reflections on the clash between intellectual property rights and human rights' protection**

Organiser: Elisa Giuliani  
Chair: Elisa Giuliani  
Panellists: Valeria Arza, Anabel Marin, Enrico Bonadio

**H** • Fulton 107

### DIALOGUE SESSION:

**Entrepreneurship, policy and industrial dynamics**

Organiser: Paul Nightingale  
Chair: Paul Nightingale  
Panellists: Alex Coad, Marc Cowling, David Storey

**I** • Jubilee 116

### DIALOGUE SESSION:

**Challenges of research impact assessment for addressing societal challenges**

Organiser: Pierre-Benoit Joly  
Chair: Philippe Larédo  
Panellists: Jordi Molas-Gallart, Arthur Mol



## SESSION 1

<b>1A</b> <b>Dialogue session</b> Fulton 104	<b>1B</b> <b>Dialogue session</b> Jubilee 155	<b>1C</b> <b>Research session</b> Jubilee 115	<b>1D</b> <b>Research session</b> Jubilee 144	<b>1E</b> <b>Research session</b> Fulton 202	<b>1F</b> <b>Governance of innovation</b> Fulton 203
<b>1G</b> <b>Community/distributed energy session</b> Fulton 113	<b>1H</b> <b>Innovation horizons</b> Jubilee 116	<b>1I</b> <b>Controversies in Technology Policy</b> Fulton 103	<b>1J</b> <b>New Conceptualisations</b> Jubilee G22	<b>1K</b> <b>Academic spinouts and knowledge transfer</b> Jubilee G31	<b>1L</b> <b>MNCs and innovation in emerging markets</b> Fulton 107

### 1A • Fulton 104

#### DIALOGUE SESSION:

##### Open science and the development of policy options for innovation

Organiser: Molly Morgan Jones  
Chair: Joanna Chataway  
Panellists: Molly Morgan Jones, Elta Smith, Kei Ito

### 1B • Jubilee 155

#### DIALOGUE SESSION:

##### Transforming evaluation: How can research assessment help address global challenges and societal transformations?

Organiser: Ismael Rafols, Michael Hopkins  
Chair: Ismael Rafols  
Panellists: Jonathan Adams, Valeria Arza, Gavin Reddick, Judith Sutz, Paul Wouters

### 1C • Jubilee 115

#### RESEARCH SESSION:

##### Innovation, sectoral systems and catch-up cycles

Organiser: Franco Malerba  
Discussant: Ariel Wirkierman  
Chair: Martin Bell  
Toward a theory of catch-up cycles and changes in industrial leadership: windows of opportunity and responses by firms and countries in the evolution of sectoral systems  
Keun Lee, Franco Malerba

Rise of the latecomers and the catch-up cycles in the world steel industry  
Keun Lee, Jeehoon Ki

A history-friendly model of the successive changes in industrial leadership and the catch-up by latecomers  
Fabio Landini, Keun Lee, Franco Malerba

### 1D • Jubilee 144

#### RESEARCH SESSION:

##### Sustainable and inclusive urban infrastructure: a need for a sea change?

##### Part 1: Sustainable and inclusive urban infrastructure: urban systems

Organiser: Ralitsa Hiteva, Kat Lovell, Tim Foxon  
Discussant: Andrew Davies  
Chair: Alex Marsh

Towards a new approach for infrastructural innovation: overcoming assumptions of governability for inclusive and resilient urban systems  
Mendel Giezen, Eric Chu, Luca Bertolini

Action space in transition to sustainable urban waste management  
Antje Klitkou, Markus M. Bugge, Arne Fevolden

Can cities be important actors in realising the public interest benefits of smart meter data?  
Jess Britton

### 1E • Fulton 202

#### RESEARCH SESSION:

##### Is market selection a useful metaphor to understand innovation and economic dynamics?

Organiser: Uwe Cantner, Simone Vannuccini  
Chair: Simone Vannuccini  
Discussant: André Lorentz

The footprint of evolutionary processes of learning and selection upon the statistical properties of industrial dynamics  
Giovanni Dosi, Marcelo C. Pereira, Maria Enrica Virgillito

Weak selection dynamics and evolutionary competition  
Werner Hözl

Schumpeterian interaction: extending the replicator dynamics  
Uwe Cantner, Simone Vannuccini

### 1F • Fulton 203

#### GOVERNANCE OF INNOVATION 1

Chair: Adrian Ely

Directing innovation with regulation: history, the status quo and proposals for change  
Erik Millstone

Experiments and beyond: an emerging agenda for climate governance  
Bruno Turnheim, Paula Kivimaa, Frans Berkhout

Asbestos, leaded petrol, and other aberrations: comparing countries' regulatory responses to disapproved innovations  
Alex Coad

### 1G • Fulton 113

#### COMMUNITY/DISTRIBUTED ENERGY SESSION

Chair: Marilyn Brown

Community energy as institutional innovation: rules, discourses and grassroots agency  
Audley Genus, Marfuga Iskandarova

Distributed energy storage systems: effects on demand volatility  
Marco Valente, Tommaso Ciarli  
Solar power-as-service – what about the impact on local energy autonomy?  
Jouni Juntunen

### 1H • Jubilee 116

#### INNOVATION HORIZONS

Chair: Gregor Semieniuk

The ecosystem implications of commercialization objectives in mission-oriented public agencies  
Mariana Mazzucato, Douglas K. R. Robinson

Biotechnology as a new techno-economic paradigm which will help power the next long upturn  
Andrew Tylecote

Triple helix innovation in a crisis era: Challenge and response  
Henry Etzkowitz, Alex Etzkowitz, Annika Rickne

### 1I • Fulton 103

#### CONTROVERSIES IN TECHNOLOGY POLICY

Chair: Laurence Williams

Innovation policy at stake: can we continue applying the recipes from national manufacturing times?  
Philippe Larédo

The Swedish National Innovation Council – governance to replace linearity with holism in innovation policy  
Charles Edquist

A solution looking for a problem? promises, social reconfigurations, and the 'deficit model' of innovation  
Joakim Juhl, Sebastian Pfotenhauer

### 1J • Jubilee G22

#### NEW CONCEPTUALISATIONS

Chair: Sabine Hielscher

Mapping and narrating a plurality of publics for socio-technological transformations  
Go Yoshizawa

Serendipity in research and innovation: towards a taxonomy and a theory  
Omid Yaqub

Additive manufacturing in transition: mobilising framing and overflowing to understand the creation and normalisation of protected spaces  
Douglas Robinson, Philippe Laredo, Axel Laguna

### 1K • Jubilee G31

#### ACADEMIC SPINOUTS AND KNOWLEDGE TRANSFER

Chair: Paloma Bernal

Upstream versus downstream antecedents of academic entrepreneurship: are scientific discoveries or interaction with users that matter?

Irene Ramos-Vielba, Pablo D'Este, Mabel Sánchez-Barrioluengo, Alfredo Yegros, Oscar Llopis

The strategic orientation of universities in knowledge transfer activities  
Paola Giuri, Alessandra Scandura, Federico Munari, Laura Toschi  
University management practices and academic spin-offs  
Francesco Rentocchini, Mario Benassi, Matteo Landoni

### 1L • Fulton 107

#### MNCs AND INNOVATION IN EMERGING MARKETS

Chair: Maria Savona

Chinese and Indian MNEs' shopping sprees in advanced countries. How good is it for their innovation output?

Elisa Giuliani, Arianna Martinelli, Roberta Rabellotti, Vito Amendolagine

How has the dual embeddedness of the multinational enterprise subsidiaries influenced the development and evolution of the Indian software innovation system?

Nidhi Chaudhary

From leapfrogging of firms to leapfrogging of industries: the effect of outward FDI by emerging market multinationals on home country industrial development  
Teis Hansen, Ulrich E. Hansen

## SESSION 2

<b>2A</b> <b>Dialogue session</b> Fulton 104	<b>2B</b> <b>Research session</b> Jubilee 155	<b>2C</b> <b>Capitalism and regime transformation</b> Jubilee 116	<b>2D</b> <b>Research session</b> Jubilee 144	<b>2E</b> <b>Research session</b> Jubilee 115	<b>2F</b> <b>Social innovations</b> Fulton 107
<b>2G</b> <b>Entrepreneurial states</b> Fulton 202	<b>2H</b> <b>Renewable energy session</b> Fulton 203	<b>2I</b> <b>Big data as a tool for mapping innovation</b> Fulton 103	<b>2J</b> <b>Medical innovation</b> Jubilee G22	<b>2K</b> <b>R&amp;D, productivity and structural change</b> Jubilee G31	

### 2A • Fulton 104

#### DIALOGUE SESSION:

##### 50 years of science technology and innovation policy in Latin America and beyond

Organiser and Chair: *Matias Ramirez*  
Panellists: *Paloma Bernal, Judith Sutz, Gabriela Dutrenit, Alejandro Olaya, Jorge Robledo Velasquez, Jose Miguel Benavente*

### 2B • Jubilee 155

#### RESEARCH SESSION:

##### Innovation systems and structural transformation from an historical perspective

Organiser and Chair: *Maria Savona*  
Discussant: *Jan Fagerberg*

Only one way to skin a cat? National innovation systems in the XXI century  
*Alessandro Nuvolari, Valeria Cirillo, Arianna Martinelli, Matteo Tranchero*  
Varieties of innovation systems and structural changes in Europe: challenges for the 21st century  
*Maria Savona*

Financial cycles and macroeconomic dynamics

*José Antonio Ocampo, Mario Cimoli*

### 2C • Jubilee 116

#### CAPITALISM AND REGIME TRANSFORMATION

Chair: *Phil Johnstone*

A firm-centred approach to analyse innovation systems in the era of global capitalism

*Juan Carlos Mondragon-Quintana*  
Social innovation and the creative destruction of capitalism: rethinking innovation after the financial crisis  
*Kyriaki Papageorgiou*

International cooperation for transformative innovation policy: how a socio-technical understanding of innovation can inform international initiatives at the intersection of innovation policy and climate action  
*Gijs Diercks, Henrik Larsen, Fred Steward*

### 2D • Jubilee 144

#### RESEARCH SESSION:

##### Sustainable and inclusive urban infrastructure: a need for a sea change?

##### Part 2: Sustainable and inclusive urban infrastructure: Decentralised and smart urban experiments?

Organiser: *Ralitsa Hiteva, Kat Lovell, Tim Foxon*

Discussant: *Ed Steinmueller*  
Chair: *Margot Weijnen*

Innovative decentralised urban infrastructure: key factors in the direction of development  
*Chris Bouch, Chris Baker, Chris Rogers, Ian Bartle*

Six contradictions of the smart-sustainable urban development discourse

*Chris Martin, James Evans, Andrew Karvonen*

Smart city construction: toward an analytical framework for smart city experimentation  
*Frans Sengers, Philipp Späth, Rob Raven*

### 2E • Jubilee 115

#### RESEARCH SESSION:

##### Investigating uncharted grounds on open innovation: understanding open innovation in SMEs

Organiser: *George Tsekouras*

Entrepreneurial experimentation: the importance of spin-off and acquisition of innovative SMEs

*Åsa Lindholm Dahlstrand, Bo Carlsson, Martin Andersson*

Open innovation ecosystems for entrepreneurs involved in social innovations  
*John Bessant*

Collaborating with 'gorillas' to scale up: challenges, strategies and implications  
*Vareska van de Vrande*

Managing open innovation projects in SMEs: a conceptual framework and a plan of research  
*George Tsekouras*

### 2F • Fulton 107

#### SOCIAL INNOVATIONS

Chair: *Adrian Smith*

Innovation as a political process of development: are Neo-Schumpeterians value neutral?

*Theo Papaioannou, Smita Srinivas*

The humanization of the economy through social innovation  
*René Kemp, Tim Strasser, Marc Davidson, Flor Avelino, Bonno Pel, Adina Dumitru, Iris Kunze, Julia Backhaus, Tim O'Riordan, Alex Haxeltine, Paul Weaver*

Plural future/s: enacting critical and speculative design at the policy-publics interface  
*Georgina Voss, Justin Pickard, Tobias Revell*

### 2G • Fulton 202

#### ENTREPRENEURIAL STATES

Chair: *Andrea Laplane*

Mission-oriented policies in practice: the case of Brazil's Inova programme  
*Mariana Mazzucato, Caetano Penna*

Strategic public entrepreneurship: dynamic collaborative governance for social innovation  
*Christopher S. Hayter, Albert Link*

The role of state investment banks in enabling low-carbon technological change

*Anna Geddes, Tobias S. Schmidt*

### 2H • Fulton 203

#### RENEWABLE ENERGY SESSION

Chair: *Mari Martiskainen*

Global development trajectories in the wind and solar energy industries: how technology-related differences shape the dynamics of international competition and knowledge transfer  
*Rainer Quitzow, Joern Huenteler, Hanna Asmussen*

Technological knowledge networks in China: the case of PV technology  
*Iciar Dominguez Lacasa, Mahmood Shubbak*

The green fling: market volatility in incumbent industries and sustainability transitions in an oil-fuelled economy  
*Jakoba Sraml Gonzalez, Tuukka Mäkitie, Håkon Endresen Normann, Taran Thune, Keith Smith*

### 2I • Fulton 103

#### BIG DATA AS A TOOL FOR MAPPING INNOVATION

Chair: *Ismael Rafols*

New data for innovation policy  
*Hasan Bakhshi, Juan Mateos-Garcia, Stian Westlake*

Exploring big data value for broadcasters: a qualitative analysis on R&D projects from BBC and NHK

*Santiago Ruiz-Navas, Kumiko Miyazaki*

Economic and technological complexity: a model study of indicators of knowledge-based innovation systems  
*Inga Ivanova, Øivind Strand, Duncan Kushnir, Loet Leydesdorff*

### 2J • Jubilee G22

#### MEDICAL INNOVATION

Chair: *Ohid Yaqub*

Brazilian research networks in dengue: evidence for policy and planning  
*Bruna de Paula Fonseca, Fabio Zicker*

Network heterogeneity, scientific performance and medical innovation

*Oscar Llopis, Maureen McKelvey, Irene Ramos-Vielba, Alfredo Yegros, Pablo D'Este*

When author becomes inventors: an empirical analysis on patent-paper-pairs in medical research

*Arianna Martinelli, Elena Romito*

### 2K • Jubilee G31

#### R&D, PRODUCTIVITY AND STRUCTURAL CHANGE

Chair: *David Walwyn*

Sector dynamics and firms demographics of top R&D investors in the global economy  
*Pietro Moncada-Paternò Castello*

The compositional nature of productivity slowdown  
*Simone Vannuccini, Uwe Cantner, Holger Graf*

Economies of skill of R&D intensive firms: breaking the law of diminishing marginal returns to labour

*Sara Amoroso*

## SESSION 3

<p><b>3A</b> <b>Dialogue session</b> Fulton 104</p>	<p><b>3B</b> <b>University-industry tech transfer</b> Jubilee 115</p>	<p><b>3C</b> <b>Transitions</b> Jubilee 116</p>	<p><b>3D</b> <b>Innovation systems</b> Jubilee 155</p>	<p><b>3E</b> <b>Technological trajectories</b> Fulton 101</p>	<p><b>3F</b> <b>Transitions in education</b> Fulton 202</p>	<p><b>3G</b> <b>Science policy</b> Jubilee 144</p>
<p><b>3H</b> <b>Organisations and innovation</b> Fulton 203</p>	<p><b>3I</b> <b>Cross-section interactions</b> Jubilee G31</p>	<p><b>3J</b> <b>Natural resource management and technological capabilities</b> Fulton 113</p>	<p><b>3K</b> <b>Policy mixes and change</b> Fulton 103</p>	<p><b>3L</b> <b>Development income trap</b> Jubilee G22</p>	<p><b>3M</b> <b>Critical evaluation</b> Fulton 107</p>	

### 3A • Fulton 104

#### FOLLOW UP SESSION TO PANEL 3 – DIALOGUE SESSION:

##### The work of the IPSP

Social progress a compass  
*Saurabh Arora*

Markets, finance and corporations: Does capitalism have a future?  
*Raphie Kaplinsky*

Inequality and social progress  
*Judith Sutz*

### 3B • Jubilee 115

#### UNIVERSITY-INDUSTRY TECH TRANSFER

Chair: *Pablo D'Este*

Dances with wolves: the role of firm and university level factors in the integration of market logics for academic spinoffs growth  
*Ugo Rizzo, Francesco Rentocchini, Laura Ramaciotti*

How does the characteristics of licensed invention affect the degree of exclusivity of university licenses? The case of two leading French research universities  
*Sila Öcalan-Özel, Julien Penin, Imad Ismail*

### 3C • Jubilee 116

#### TRANSITIONS

Chair: *Tim Foxon*

Sites of a grand societal experiment  
*Arie Rip*

How to study transition problems: a systematic review and methodological critique  
*Mohammadreza Zolfagharian*

### 3D • Jubilee 155

#### INNOVATION SYSTEMS

Chair: *Karoline Rogge*

Global innovation systems: a framework for technological innovation in transnational contexts  
*Christian Binz, Bernhard Truffer, Lars Coenen*

Adjusting the innovation systems 'lens' through experiences with energy system change  
*Alexandra Mallett*

### 3E • Fulton 101

#### TECHNOLOGICAL TRAJECTORIES

Chair: *Marco Valente*

Technological diffusion as a recombinant process: a look to patent data  
*Petros Gkotsis, Antonio Vezzani*

Mapping research priorities and their relation to societal needs over time: the case of rice research since the '80s  
*Tommaso Ciarli, Ismael Rafols*

### 3F • Fulton 202

#### TRANSITIONS IN EDUCATION

Chair: *Audley Genus*

Integrating Responsible Research and Innovation (RRI) into scientific training: learning lessons across borders, UK and Brazil  
*Christopher Till, André Sica de Campos, Emma Frow, Janaina Pamplona da Costa, Margarita Staykova, Sara Wilford*

Don't talk to strangers? Cognitive proximity, social proximity and the productivity of mobile inventors  
*Rasmus Bode, Guido Buenstorf, Dominik P. Heinisch*

### 3G • Jubilee 144

#### SCIENCE POLICY

Chair: *Ben Martin*

Model answers  
*Paul Nightingale*

Science policy and policy science: an inquiry into public policy scholarship  
*Caroline Wagner*

### 3H • Fulton 203

#### ORGANISATIONS AND INNOVATION

Chair: *Youngha Chang*

Intergenerational succession and family business innovation: case of machinery manufacturing sector in Ankara  
*Merve Gül Barut, Semih Akcomak, Çağrı Topal*

Adoption and re-adaptation of management practices: the paradox of abandon  
*Rosane Argou Marques, Isabel Maria Bodas Freitas, Gazi Islam*

### 3I • Jubilee G31

#### CROSS-SECTION INTERACTIONS

Chair: *Ariel Luis Wirkierman*

Lock-in of mature innovation systems: the transformation toward clean concrete in the Netherlands  
*Alexander van der Vooren, Joeri H. Wesseling*

Cross-sectoral technological knowledge acquisition and exploitation in the functional food industrial convergence: empirical study from Japanese functional food industry  
*Paveena Lalitnorasate, Kumiko Miyazaki*

### 3J • Fulton 113

#### NATURAL RESOURCE MANAGEMENT AND TECHNOLOGICAL CAPABILITIES

Chair: *Elisa Arond*

Diversity and innovation in natural resource based industries: implications for industry development, sustainability transitions, and innovation theory  
*Allan Dahl Andersen, Olav Wicken*

Sustainable management of natural resources via enhancing knowledge base: experiences from Latin American countries  
*Michiko Iizuka, Fernando Vargas Cuevas, Jakob Baumann*

### 3K • Fulton 103

#### POLICY MIXES AND CHANGE

Chair: *Paula Kivimaa*

Alignment of innovation objectives in the policy mix  
*Isabel Maria Bodas Freitas*

Designing policy mixes for transformative changes: towards a common framework  
*Sebastian Sewerin, Tobias S. Schmidt*

### 3L • Jubilee G22

#### DEVELOPMENT INCOME TRAP

Chair: *Florian Kern*

Trapped in the middle. Development, R&D and the national innovation system  
*Diana Suárez, Analía Erbes*

Korea's innovation system transition at the crossroad: system failure or post catch-up?  
*Jae-Yong Chung, Hye-ran Hwang*

### 3M • Fulton 107

#### CRITICAL EVALUATION

Chair: *Parimal Patel*

Policy considerations for evidence-based measures of complex innovation systems  
*Sylvan Katz*

Old boys network: gender gap in science in Japan  
*Aldo Geuna*

## SESSION 4

<p><b>4A</b> <b>Research funding and organisations of science</b> Fulton 107</p>	<p><b>4B</b> <b>Direction and organisation of research funding</b> Fulton 202</p>	<p><b>4C</b> <b>Politics of inclusion</b> Fulton 104</p>	<p><b>4D</b> <b>Transition regimes and competences</b> Jubilee 115</p>	<p><b>4E</b> <b>GVC governance, development and catching up</b> Fulton 203</p>	<p><b>4F</b> <b>Building futures</b> Fulton 113</p>
<p><b>4G</b> <b>Green innovation: the firm perspective</b> Fulton 103</p>	<p><b>4H</b> <b>International organisation of research</b> Jubilee G22</p>	<p><b>4I</b> <b>Medical innovation</b> Jubilee 144</p>	<p><b>4J</b> <b>STI funding</b> Jubilee 116</p>	<p><b>4K</b> <b>Innovation indicators and performance</b> Jubilee 155</p>	<p><b>4L</b> <b>Opening ICTs</b> Fulton 101</p>

### 4A • Fulton 107

#### RESEARCH FUNDING AND ORGANISATIONS OF SCIENCE

Chair: Rosane Argou Marques

Back to basics – revisiting rhetoric of competitive research funding allocation and impact agenda in Sweden  
*Katarina Larsen, Susanne Nilsson*

Transforming public research organisations in post-socialist Poland: old limitations and new routes to intellectual renewal  
*Steffi Heinecke*

### 4B • Fulton 202

#### DIRECTION AND ORGANISATION OF RESEARCH FUNDING

Chair: Stathis Arapostathis

R&D policy based on goals: missing the target  
*Adão Carvalho*

Funding transformative research: ESRC's challenge to conservatism in peer review  
*Peter Kolarz, Erik Arnold*

### 4C • Fulton 104

#### POLITICS OF INCLUSION

Chair: Valeria Arza

The politics of inclusion: decentralising science, technology and innovation for regional development in Colombia  
*Elisa Arond*

Including indigenous communities in ICTs innovation: the case of first nations in Northern Canada  
*Martha Burkle*

### 4D • Jubilee 115

#### TRANSITION REGIMES AND COMPETENCES

Chair: Florian Kern

Competences for sustainability transitions – the Climate-KIC Transitions Hub  
*Fred Steward, Cristian Matti, Andreas Huck*

Global socio-technical regimes  
*Lea Fuenfschilling, Christian Binz*

### 4E • Fulton 203

#### GVC GOVERNANCE, DEVELOPMENT AND CATCHING UP

Chair: Abel Osvaldo Villa Rodríguez

Small farmers' technological learning in berries for export markets  
*Cecilia Ibarra, Matias Ramirez*

Sustainability transition and technological catch-up guidance of search as a strategic mechanism for leapfrogging  
*Xiao-Shan Yap, Bernhard Truffer*

### 4F • Fulton 113

#### BUILDING FUTURES

Chair: Michael Keenan

Transformative futures of research and innovation: a meta-analysis of two scenario-building exercises  
*K. Matthias Weber, Stephanie Daimer*

The contrasted delineation of futures: the case of agroecological transition in France.  
*Marc Barbier, Sébastien Treyer, Jessica Thomas, Sarah Lumbroso*

### 4G • Fulton 103

#### GREEN INNOVATION: THE FIRM PERSPECTIVE

Chair: Ugo Rizzo

External support for resource efficiency measures adoption: an empirical analysis on European SMEs  
*Isabel Maria Bodas Freitas, Nicoletta Corrocher*

Opportunities for eco-innovation: identifying actors and underlying knowledge bases in the Netherlands  
*Floortje Alkemade, Carolina Castaldi, Onder Nomaler*

### 4H • Jubilee G22

#### INTERNATIONAL ORGANISATION OF RESEARCH

Chair: Allam Ahmed

Intergenerational transfer of scientific knowledge and sustainable development of science  
*Sotaro Shibayama*

Architecting complex international partnerships (CISTIPs) for capacity-building in science, technology, and innovation: a study of four global MIT collaborations  
*Sebastian Pfotenhauer, Danielle Wood*

### 4I • Jubilee 144

#### MEDICAL INNOVATION

Chair: Piera Molarcchi

Innovation in health care: the contributions of hospital employees to research- and practice-based innovations  
*Taran Thune, Magnus Gulbrandsen*

Knowledge-intensive consumer services: case study evidence on the growth of innovative global healthcare tradables  
*Janaina Pamplona da Costa, Cátia Costa, Sandro Mendonça*

### 4J • Jubilee 116

#### STI FUNDING

Chair: Caetano Penna

Innovation in times of financialisation – does financialisation decrease future-oriented innovations in co-ordinated market economies? The example of Germany  
*Katrin Hahn*

STI policies, national innovation system and framework conditions: their impacts on innovation performance in Hungary  
*Attila Havas*

### 4K • Jubilee 155

#### INNOVATION INDICATORS AND PERFORMANCE

Chairs: Chux Daniels and David Walwyn

Innovation in Africa: Measurement, policy and global issues  
*Fred Gault, Aggrey Ambali, Tichaona Mangwende*

On the origins of patents as an invention indicator: the legacy of early steam navigation entrepreneurship and historiography  
*Sandro Mendonça*

### 4L • Fulton 101

#### OPENING ICTS

Chair: Ed Steinmueller

Situating open government Data: a crossroads in government-citizen relationships?  
*Daniel J. Paré*

Open Innovation: revealing and engagement in open data organisations  
*Franz Huber, Francesco Rentocchini, Thomas Wainwright*

## SESSION 5

<b>5A</b> <b>Dialogue session</b> Fulton 104	<b>5B</b> <b>Research session</b> Jubilee 144	<b>5C</b> <b>Research session</b> Jubilee 155	<b>5D</b> <b>Research session</b> Jubilee 115	<b>5E</b> <b>Prospective technological pathways</b> Fulton 107	<b>5F</b> <b>Technology drivers</b> Fulton 202
<b>5G</b> <b>Agricultural innovation</b> Fulton 203	<b>5H</b> <b>Science, technology and development</b> Jubilee 116	<b>5I</b> <b>Medical innovation</b> Fulton 103	<b>5J</b> <b>Green entrepreneurship, innovation and skills</b> Fulton 113	<b>5K</b> <b>Micro-innovation and development</b> Jubilee G22	

### 5A • Fulton 104

#### DIALOGUE SESSION:

**Local production of medicines in LMICs: how can it promote innovative capabilities for resilient and responsive health systems in changing African contexts?**

Organiser: *Geoffrey Banda*  
Chair: *Maureen Mackintosh*  
Panellists: *Joanna Chataway, Dinar Kale, Julius Mugwagwa, Geoffrey Banda*

### 5B • Jubilee 144

#### RESEARCH SESSION:

**Sustainable and inclusive urban infrastructure: a need for a sea change?**

**Part 3: Sustainable and inclusive urban infrastructure: critical perspectives on infrastructure governance**

Organisers: *Ralitsa Hiteva, Kat Lovell, Tim Foxon*  
Discussant: *Tim Brady*  
Chair: *Liz Varga*

Purposeful and systemic infrastructure governance – a pre-requisite for the creation of sustainable and inclusive cities (societies)?

*Tom Dolan*

Value creation and capture for a low carbon infrastructure

*Ralitsa Hiteva, Tim Foxon, Kat Lovell*

How transitions may derail: Lessons from innovation and infrastructure history

*Erik van der Vleuten*

### 5C • Jubilee 155

#### RESEARCH SESSION:

**The role of hospitals in innovation**

Organiser: *Bryn Lander*

Commentator: *Magnus Gulbrandsen*  
Chair: *Piera Morlacchi*

Bench to bedside? Boundaries and innovation in academic health science centres

*Catherine French, Ewan Ferlie, Naomi Fulop*

At your service: drawing on evidence in clinical practice

*Bryn Lander, Ellen Balka*

Buying health? Mobilising hospital procurement for sustainable innovation

*Fiona Alice Miller, Pascale Lehoux*

### 5D • Jubilee 115

#### RESEARCH SESSION:

**Direction and pace of green technology innovation: What do we need to know about finance and policy to influence it?**

Organiser and Chair: *Gregor Semieniuk*  
Discussant: *Ariel Wirkierman*

Capitalism, technology and a green global golden age: the role of history in helping to shape the future

*Carlota Perez*  
Financing renewable energy: who is financing what and why it matters

*Mariana Mazzucato, Gregor Semieniuk*

### 5E • Fulton 107

#### PROSPECTIVE TECHNOLOGICAL PATHWAYS

Chair: *Chiara Fratini*

The cost of hybrid waste water systems: a systematic framework for specifying minimum cost-connection rates

*Sven Eggimann, Bernhard Truffer, Max Maureer*

The construction of socio-technical trajectories for technology assessment applications to the German policy field of electric mobility

*Bernhard Truffer, Jens Schippl, Torsten Fleischer*

### 5F • Fulton 202

#### TECHNOLOGY DRIVERS

Chair: *Jenny Lieu*

Reformulating rationales for public procurement for innovation (PPI) policies: insights from the China-Brazil Earth Resources Satellite (CBERS) programme

*Milton de Chagas Freitas, André Sica de Campos, Janaina Pamplona, André Furtado*

Tailoring innovation policies to technology-specific learning patterns: an analysis of knowledge feedbacks in three clean energy technology innovation systems

*Abhishek Malhotra, Tobias Schmidt, Joern Huenteler*

Tech to social or social to tech: path dependency and the birth of a new entrepreneurial genre.

*Mario Calderini, Veronica Chiodo, Mattia Corbetta*

### 5G • Fulton 203

#### AGRICULTURAL INNOVATION

Chair: *Ruth Segal*

Agro-ecological innovation: fitting or transforming the dominant agro-food system?

*Les Levidow*

Impact appraisals of genetically engineered crops: informing or forming technological choices?

*Patrick van Zwanenberg, Anabel Marin*

The structural change on rice agriculture system in Japan by the introducing policy of innovation

*Shingen Yamamoto, Yutaka Takahashi*

### 5H • Jubilee 116

#### SCIENCE, TECHNOLOGY AND DEVELOPMENT

Chair: *Maria Savona*

Benefits and obstacles of openness in science: evidence from four case-studies in Argentina

*Valeria Arza, Mariano Fressoli*

South-south trade in capital goods: the market driven diffusion of appropriate technology

*Raphie Kaplinsky, Rebecca Hanlin*

### 5I • Fulton 103

#### MEDICAL INNOVATION 2

Chair: *Philippa Crane*

Designing technologies for sustainable healthcare systems: articulating a new research agenda on responsible innovation in health

*Pascale Lehoux*

Co-creation in innovation - towards a theory of co-creation in converging health innovations

*Ellen Moors*

Do funding sources complement? The case of the UK Cancer Research

*Daniele Rotolo, Michael Hopkins, Nicola Grassano*

### 5J • Fulton 113

#### GREEN ENTREPRENEURSHIP, INNOVATION AND SKILLS

Chair: *Tomas Saieg*

Better late than never: a longitudinal quantile regression approach to the interplay of firm growth, green technology and age

*Riccardo Leoncini, Alberto Marzucchi, Sandro Montresor, Francesco Rentocchini, Ugo Rizzo*  
A typological process of policy change: the case of China's new energy vehicle industry

*Lei Xu, Jun Su*

### 5K • Jubilee G22

#### MICRO-INNOVATION AND DEVELOPMENT

Chair: *Saurabh Arora*

Creating societal value through corporate entrepreneurship at 'Bottom of the Pyramid' markets

*Addisu Lashitew*  
Cursed is the ground because of you – religion, ethnicity, and the adoption of fertilizers in rural Ethiopia

*Marco Guerzoni, Alexander Jordan*

Inclusive innovation at the UK's

Department for International

Development (DFID)

*Anke Schwittay, Paul Braund*



## SESSION 6

<b>6A</b> <b>Dialogue session</b> Fulton 104	<b>6B</b> <b>Dialogue session</b> Fulton 107	<b>6C</b> <b>Research session</b> Jubilee 116	<b>6D</b> <b>Research session</b> Jubilee 144	<b>6E</b> <b>Innovation in knowledge intensive and creative sectors</b> Jubilee 115	<b>6F</b> <b>Standard, regulation and innovation</b> Fulton 202
<b>6G</b> <b>R&amp;D responses to external and internal pressures</b> Fulton 203	<b>6H</b> <b>Inclusive innovation</b> Jubilee 155	<b>6I</b> <b>Research evaluation</b> Fulton 103	<b>6J</b> <b>Governance of innovation</b> Jubilee G22	<b>6K</b> <b>Infrastructure innovation</b> Jubilee G31	

### 6A • Fulton 104

#### DIALOGUE SESSION:

##### Learning innovation agencies and entrepreneurial ecosystems

*Organiser: José Manuel Leceta*  
*Chair: José Manuel Leceta*  
*Panellists: Ben Martin, Charles Edquist, Francisco Marin, Josep M. Pique, Mariana Mazzucato*

### 6B • Fulton 107

#### DIALOGUE SESSION:

##### Innovation in healthcare delivery: What it takes to succeed?

*Organiser: Peter Varnai, Maike Rentel*  
*Chair: Peter Varnai*  
*Panellists: James Barlow, Parties Boekholt, Joanna Chataway, Valerie Shanks-Pepper*

### 6C • Jubilee 116

#### RESEARCH SESSION:

##### Intermediary actors in innovation and energy system transition (1)

*Organisers and Chairs: Paula Kivimaa, Anna Bergek*  
*Commentator: Wouter Boon*  
Mapping diffusion intermediaries: conceptualization and empirical application to the case of renewable energy technology in Sweden  
*Anna Bergek, Ingrid Mignon, Johanna Nählinder*  
Do intermediary organisations challenge the incumbent?  
*Kaisa Matschoss, Eva Heiskanen*  
Intermediaries and champions in low energy housing innovation – lessons from case studies in the UK  
*Mari Martiskainen, Paula Kivimaa*

### 6D • Jubilee 144

#### RESEARCH SESSION:

##### The interaction between innovation, employment, inequality, and the environment contrasting evolutionary models on global challenges (1)

*Organiser: Tommaso Ciarli*  
*Chair: Richard Nelson*  
*Commentators: Andrea Roventini and Tim Foxon*

When more flexibility yields more fragility: the microfoundations of Keynesian aggregate unemployment  
*Andrea Roventini*

Faraway, so close: an agent-based model for climate, energy and macroeconomic policy  
*Francesco Lamperti*

An evolutionary model of the risk-reward mechanism in the innovation-inequality relationship  
*Ariel Luis Wirkierman*

### 6E • Jubilee 115

#### INNOVATION IN KNOWLEDGE INTENSIVE AND CREATIVE SECTORS

*Chair: Monica Masucci*  
Knowledge intensive entrepreneurship: going beyond the Schumpeterian entrepreneur  
*Maureen McKelvey, Franco Malerba*  
Developing a statistical standard for the creative industries  
*Alan Freeman, Hasan Bakhshi, John Davies, Peter Higgs, Stuart Cunningham*  
Competitive moves during disruptiveness: a study of digitisation in the Dutch music industry  
*Amber Geurts, Thijs Broekhuizen, Wilfred Dolfsma*

### 6F • Fulton 202

#### STANDARD, REGULATION AND INNOVATION

*Chair: Erik Millstone*  
Sustainability standards for biofuels: epistemic jurisdiction and its problems in global governance  
*David Winickoff, Matthieu Mondou*  
Platforms and standards: an historical perspective  
*Ed Steinmueller*  
Stabilising and de-stabilising toxic regimes: experts, law and agriculture politics in Greece 1940-2015  
*Stathis Arapostathis*

### 6G • Fulton 203

#### R&D RESPONSES TO EXTERNAL AND INTERNAL PRESSURES

*Chair: Joe Tidd*  
Sailing in all winds: technological search over the business cycle  
*Daniela Silvestri, Massimo Riccaboni, Antonio Della Malva*  
The benefit of failure: does learning-by-failing contribute to successful innovations?  
*Elena Cefis, Riccardo Leoncini*  
The evolutionary roots of adaptive capacity: how the past quirks of an organisation's environment influence its future latitude  
*Allard van Mossel*

### 6H • Jubilee 155 (50)

#### INCLUSIVE INNOVATION

*Chair: Mammo Muchie*  
Reflections on analytical challenges of science, technology and innovation policies to deal with poverty problems: a specific reference to Mexico  
*Rosalba Casas Guerrero*  
Design aspects of frugal innovation: a new type of product innovation and its management issues  
*Chaisung Lim, Takahiro Fujimoto*  
Transformative change for an inclusive society: insights from social innovations and implications for innovation policy  
*Paul M. Weaver, René Kemp, Tim Strasser, Julia Backhaus, Bonno Pel, Flor Avelino*

### 6I • Fulton 103

#### RESEARCH EVALUATION

*Chair: James Revill*  
Assessing the impact of research and innovation: an analysis of evidence, metrics and narratives used in REF2014 business and management impact case studies  
*Claire Donovan, Martin Ejnar Hansen*  
Towards a novel method of research evaluation: tracking proximity change in translational research projects.  
*Frédérique Lang, Michael Hopkins, Jordi Molas-Gallart, Ismael Rafols, Puay Tang*  
University research system transformation: connecting shifting governance to dynamics of citation distributions  
*Diana Hicks, Jian Wang*

### 6J • Jubilee G22

#### GOVERNANCE OF INNOVATION

*Chair: Caitriona McLeish*  
Analysing the governance of intermediary organisations and its impact in emerging agricultural clusters  
*Matias Ramirez, Ian Clarke, Laurens Klerkx*  
Innovation for the global commons: multilateral collaboration and polycentric governance in a heteropolar world  
*Keith Smith*  
Governing genetic resources to address global challenges: right intentions; wrong outcomes  
*Catherine Rhodes*

### 6K • Jubilee G31

#### INFRASTRUCTURE INNOVATION

*Chair: Ralitsa Hiteva*  
Too old to fail? Innovation in mature infrastructure sectors  
*Kat Lovell*  
The politics of infrastructure pilot projects  
*Harald Rohrer, Thomas Berker*  
Strategies of the main actors related to the diffusion of smart houses in Japan  
*Kumiko Miyazaki, Kentarou Nishida*

## SESSION 7

<p><b>7A</b> <b>Dialogue session</b> Jubilee 155</p>	<p><b>7B</b> <b>Research session</b> Fulton 104</p>	<p><b>7C</b> <b>Research session</b> Jubilee 116</p>	<p><b>7D</b> <b>Research session</b> Jubilee 144 LT</p>	<p><b>7E</b> <b>Research session</b> Jubilee 115</p>
<p><b>7F</b> <b>Regional and urban politics of innovation</b> Fulton 107</p>	<p><b>7G</b> <b>University-industry relations</b> Fulton 202</p>	<p><b>7H</b> <b>Electric mobility</b> Fulton 103</p>	<p><b>7I</b> <b>Evaluating innovation impact</b> Jubilee G31</p>	<p><b>7J</b> <b>Green entrepreneurship, innovation and skills</b> Jubilee G22</p>

### 7A • Jubilee 155

#### DIALOGUE SESSION:

**Innovating policy: Transdisciplinary practice and the politics of co-construction in policy labs**

*Organiser: Susanna Nascimento*

*Chair: Adrian Smith*

*Panellists: Susana Nascimento, Ann Light, Lucy Kimbell, Lars Elmgreen, Alex Oprunenco*

### 7B • Fulton 104

#### RESEARCH SESSION:

**Innovation and the creative economy: Fusion, confusion and the policy challenge**

*Organiser: Jonathan Sapsed*

*Chair: Beatrice D'Ippolito*

*Discussant: Christopher Tucci*

Exploring the determinants of creative-digital-IT skills fusion: the case of the Brighton cluster

*Jonathan Sapsed, Roberto Camerani, Juan Mateos-Garcia, Paul Nightingale*

Creative diversity and firm performance: the complementary role of arts and science skills

*Josh Siepel, Roberto Camerani, Monica Masucci*

Innovation policies for a creative economy: challenging the dominance of science and technology

*Bruce Tether, Mickael Benaim*

### 7C • Jubilee 116

#### RESEARCH SESSION:

**Intermediary actors in innovation and energy system transition (2)**

*Organiser: Paula Kivimaa, Anna Bergek*

*Commentator: Matias Ramirez*

Community-based intermediation for local embedding

*Jacob Barnes*

Lessons from natural resource management to energy policy intermediation

*Eeva Primmer, Suvi Huttunen*

From a systematic review to a dynamic typology of intermediaries in transitions

*Paula Kivimaa, Wouter Boon, Sampsa Hyysalo, Laurens Klerix*

### 7D • Jubilee 144 LT

#### RESEARCH SESSION:

**The interaction between innovation, employment, inequality, and the environment contrasting evolutionary models on global challenges (2)**

*Organiser: Tommaso Ciarli*

*Chair: Giovanni Dosi*

*Commentators: Andrea Roventini, Tim Foxon*

A history-friendly model of structural change and productivity growth: policies and divergence in comparative perspective

*Mario Cimoli*

Be patient enough to wait what you deserve: banks' time horizons, borrowing constraints and the evolution of industries

*Mauro Napoletano*

Structural changes and growth regimes

*André Lorentz*

### 7E • Jubilee 115

#### RESEARCH SESSION:

**Building blocks for a new innovation theory addressing social change**

*Organiser: Johan Schot*

*Commentator: Richard Nelson*

*Chair: Arie Rip*

The need for an updated framework for innovation policy

*Luc Soete*

How did we grow apart?

*Robin Williams*

Towards a new innovation theory for grand societal challenges

*Frank Geels, Johan Schot*

### 7F • Fulton 107

#### REGIONAL AND URBAN POLITICS OF INNOVATION

*Chair: Cian O'Donovan*

Placed-based policies for innovation

– a critical assessment of the S3 governance system and the Entrepreneurial discovery in Eastern Macedonia and Thrace

*Elisabetta Marinelli, Mark Boden, Patrice Dos Santos, Karel Haegeman*

An innovation system framework for system innovation policy: the case of Strategic Innovation Programs (SIPs) in Sweden

*Lars Coenen, Jerker Moodysson, Teis Hansen, Markus Grillitsch*

### 7G • Fulton 202

#### UNIVERSITY-INDUSTRY RELATIONS

*Chair: Matteo Landoni*

The retreat of public research and its adverse consequences on knowledge, innovation and social welfare

*Daniele Archibugi, Andrea Filippetti*

Funding portfolio for academic research: from additionality of sources to production of science

*Stefano Bianchini, Patrick Llerena*

The efficiency of Portuguese Technology Transfer Offices and the importance of university characteristics

*Aurora A.C. Teixeira, André Monteiro*

### 7H • Fulton 103

#### ELECTRIC MOBILITY

*Chair: Frank Southworth*

Full speed ahead: challenges and implications of the UK strategy for autonomous vehicle deployment

*Jean-Paul Skeete*

A policy review: assessing the development of electric vehicles in China

*Michael Nauruschat, Tong-Yaa Su*

The drivers of green driving: analysing the intention to buy electric vehicles in European countries

*Grazia Cecere, Nicoletta Corrocher, Marco Guerzoni*

### 7I • Jubilee G31

#### EVALUATING INNOVATION IMPACT

*Chair: Ismael Rafols*

The returns to scientific specialisation

*Orion Penner, Gaétan de Rassenfosse*

Mapping private R&D outputs: the contribution of top R&D companies to scientific literature

*Roberto Camerani, Daniele Rotolo, Nicola Grassano*

Assessing the quality and impact of scientific research: a comparative analysis of the Global South versus the Global North

*Manuel Godinho, Hugo Confraria, Lili Wang*

### 7J • Jubilee G22

#### GREEN ENTREPRENEURSHIP, INNOVATION AND SKILLS

*Chair: Alberto Marzucchi*

Adaptive and transformative green growth: two sides of the same coin?

*Davide Consoli, Nicolo Barbieri*

Energy-efficient innovation and firm size: how different firms respond to different institutional pressures

*Luca Grilli, Paola Garrone, Boris Mrkajic*

Green technology based firms (GTBF): business as usual?

*Pelin Demirel, Giuliana Battisti*

## SESSION 8

<p><b>8A</b> <b>Dialogue session</b> Fulton 104</p>	<p><b>8B</b> <b>Dialogue session</b> Jubilee 116</p>	<p><b>8C</b> <b>Research session</b> Jubilee 155</p>	<p><b>8D</b> <b>Research session</b> Fulton 202</p>	<p><b>8E</b> <b>Consumer interactions</b> Fulton 203</p>
<p><b>8F</b> <b>Technology upgrading</b> Fulton 103</p>	<p><b>8G</b> <b>Public foresight and entrepreneurship</b> Jubilee G22</p>	<p><b>8H</b> <b>Institutional collaborations and innovation</b> Jubilee 115</p>	<p><b>8I</b> <b>Mining/extractive industries</b> Fulton 107</p>	<p><b>8J</b> <b>Flirting with knowledge</b> Jubilee 144</p>

### 8A • Fulton 104

#### DIALOGUE SESSION:

##### Political economy of finance in technology and innovation

Organiser: Lucy Baker  
Panellists: Tim Foxon, Mariana Mazzucato, Gregor Semieniuk, Stephen Spratt

### 8B • Jubilee 116

#### DIALOGUE SESSION:

##### Science fiction and innovation: who is leading the dance?

Organiser: Ed Steinmueller, Daniele Archibugi  
Chair: Saurabh Arora  
Panellists: Daniele Archibugi, Ralitsa Hiteva, Ed Steinmueller, Caroline Bassett

### 8C • Jubilee 155

#### RESEARCH SESSION:

##### Innovation and industrial performance: firm level analysis

Organiser: Federico Tamagni  
Discussant: Angelo Secchi  
Technological innovation and the distribution of employment growth: a firm level analysis  
Flavio Calvino

What do firms know? What do they produce? A new look at the relationship between patenting profiles and patterns of product diversification  
Giovanni Dosi, Marco Grazzi, Daniele Moschella

Persistence of innovation and patterns of firm growth  
Dario Guarascio, Federico Tamagni

### 8D • Fulton 202

#### RESEARCH SESSION:

##### Learning from failure: Decline, displacement and defeat of process technologies

Organiser: Anne-Marie Coles  
Chair and commentator: S R Peters  
Development, stagnation and decline of process technologies: an observation of the history of two CHP application niches  
Anton Sentic

Range anxiety and electric vehicles: 'battery swapping' as an example of technological and business model experimentation  
Ian Clarke

Dynamics of technology decline: the case of pressed glass manufacturing in England  
Athena Piterou, Anne-Marie Coles

### 8E • Fulton 203

#### CONSUMER INTERACTIONS

Chair: Sungjoo Lee  
The echoes of bandwagon through a complex system of innovation and development  
João Basilio Pereira, Pedro Einloft, Francisco Gabardo

The sharing economy: A case of 'reverse' technology assessment  
Koen Frenken

Adoption and diffusion of shared goods in consumers' coalitions: an agent-based simulation  
Francesco Pasimeni, Tommaso Ciarli

### 8F • Fulton 103

#### TECHNOLOGY UPGRADING

Chair: Raphael Kaplinsky  
Catching up with the international oil firms: a Penrosean view of upgrading and innovation barriers in china's refining industry  
Damian Tobin  
Technology upgrading of middle-income economies: a new framework and evidence  
Slavo Radosevic, Esin Yoruk

### 8G • Jubilee G22

#### PUBLIC FORESIGHT AND ENTREPRENEURSHIP

Chair: Markku Wilenius  
Entrepreneurial ecosystems: the role of government alliances as drivers of innovation  
Claudia Doblínger, Kavita Surana, Laura Diaz Anadona

Institutional intermediation in public procurement of innovation: satellite telecommunications in Italy  
Matteo Landoni

Forward looking innovation policy: insights from foresight experts  
Sofi Kurki

### 8H • Jubilee 115

#### INSTITUTIONAL COLLABORATIONS AND INNOVATION

Chair: Frédérique Lang  
Why do firms, universities and governmental bodies collaborate in multidisciplinary research programs? A mixed methods approach to evaluation.  
Kevin PF Broecks, Frank J. van Rijnsoever

How does the public research organizations-industry interaction affect firms' innovation dynamics?  
José Miguel Natera, Gabriela Dutrénit

### 8I • Fulton 107

#### MINING/EXTRACTIVE INDUSTRIES

Chair: Blanche Ting  
Discovering new public-private partnerships for productive and technological development in emerging mining countries  
Osvaldo Urzua, Michiko Iizuka, Fernando Vargas-Cuevas, Jakob Baumann, Alejandra Wood

How to improve collaboration between industry, government, universities and the community to face industry challenges: the case of the Chilean Mining Programme 'Alta Ley'  
Veronica Roa, Julio González, Jorge Torres

The commercialisation of shale gas extraction technology: tests with US patent data  
Isabel Bodas-Freitas, David Grover, Kaboo PY Leung

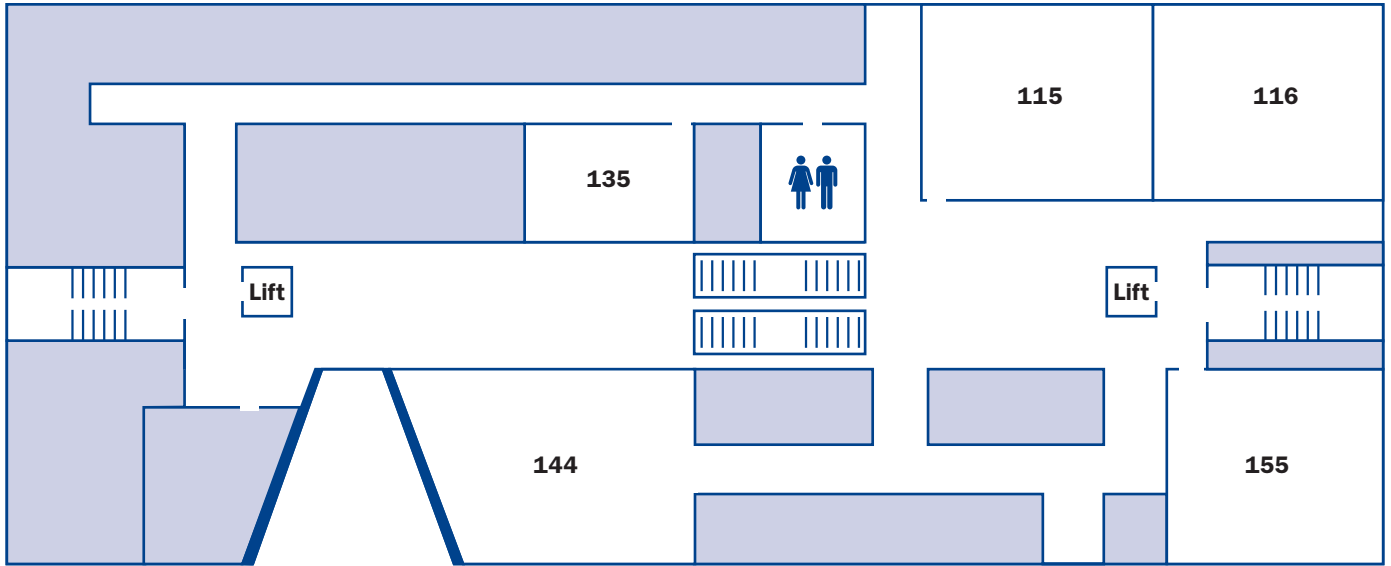
### 8J • Jubilee 144

#### FLIRTING WITH KNOWLEDGE

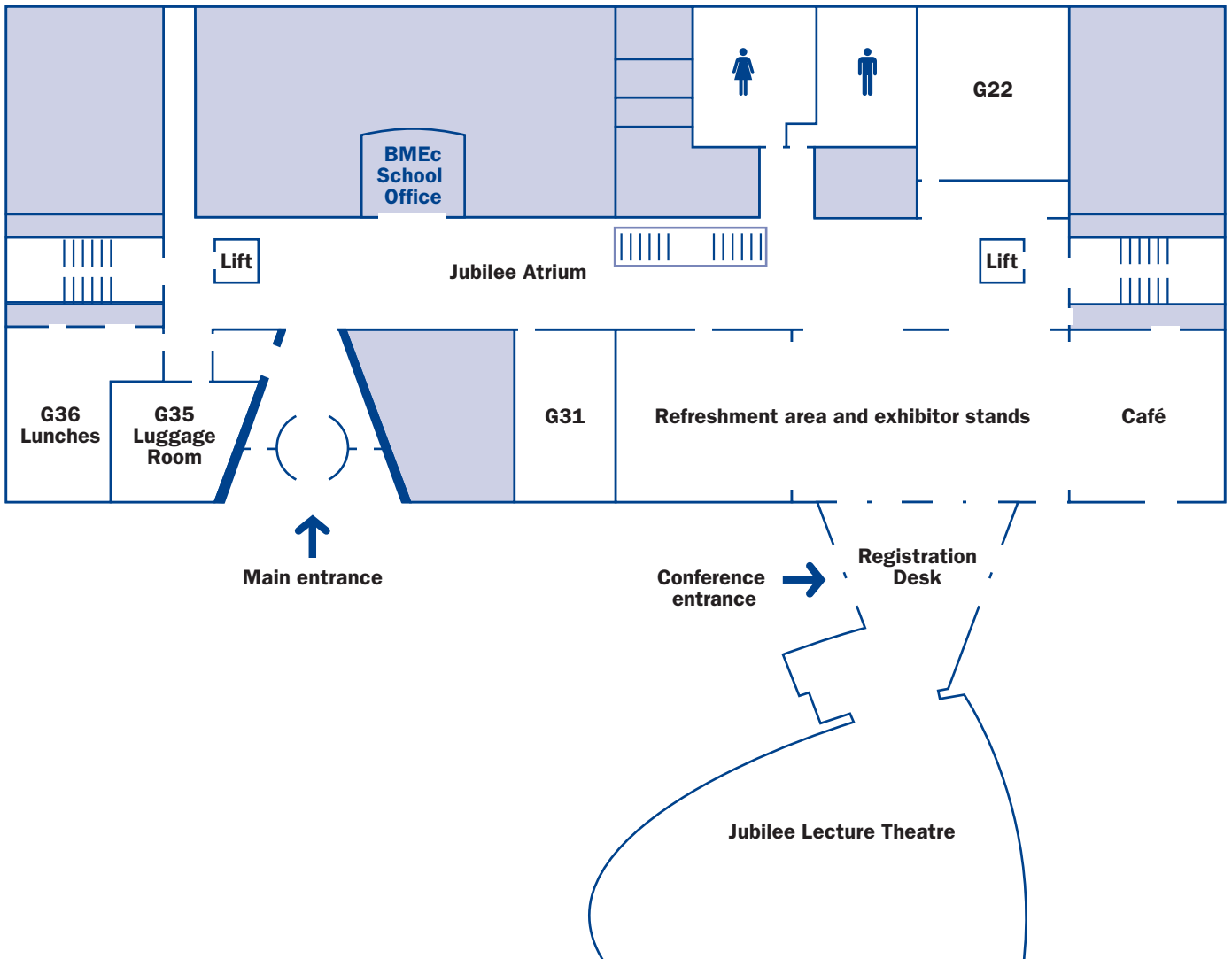
Chair: Josh Siepel  
It takes more than two to tango: building up linkages between Non High-tech SMEs and Universities  
George Tsekouras, Andre de Campos  
Seduced into collaboration: a resource-based choice experiment to explain knowledge acquisition strategies of SMEs  
Frank J. van Rijnsoever, Sander N. Kempkes, Maryse Chappin  
Global mismatch in knowledge production  
Patrick Gaule, Ruchir Agarwal

# Jubilee Building

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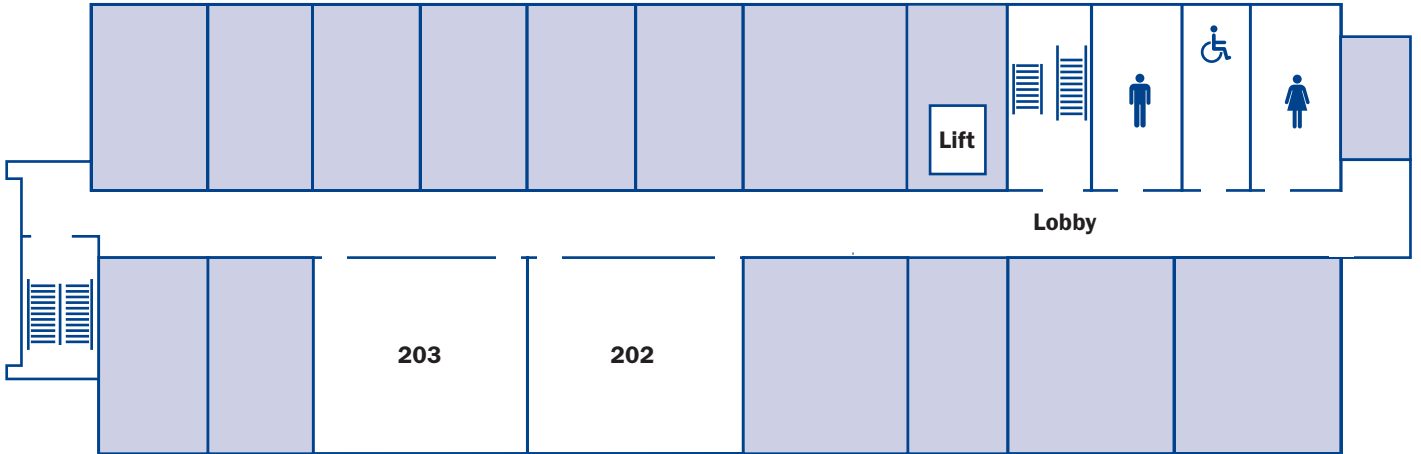


## GROUND FLOOR

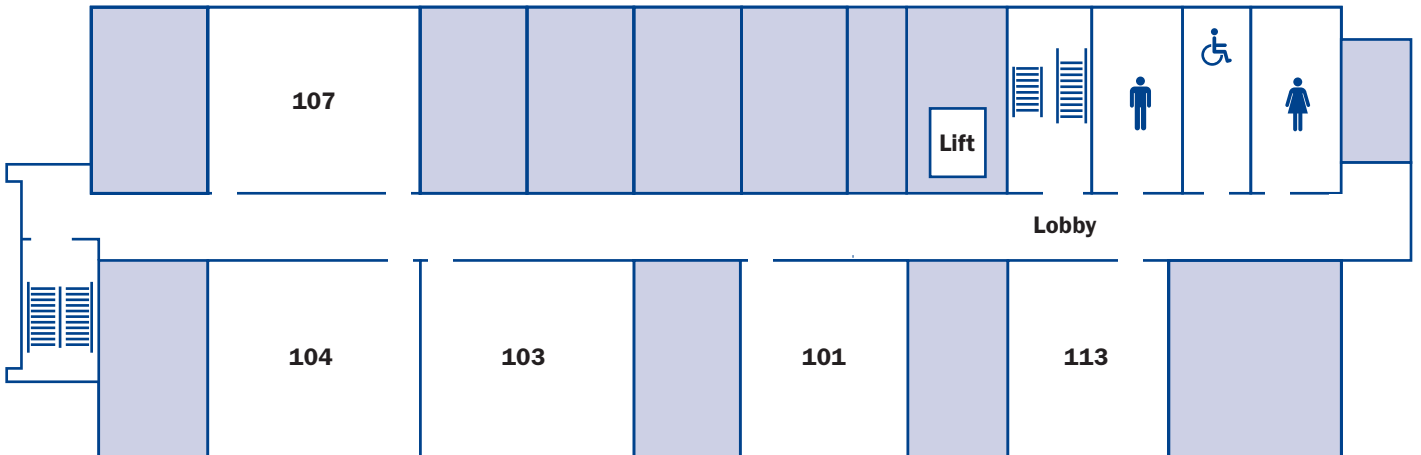


# Fulton Building

## SECOND FLOOR



## FIRST FLOOR



All activities within the Fulton Building occur on the first and second floor. Please use the lift and stairs to access the necessary level.



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+44 (0)1273 873398

**SPRU**  
School of Business, Management and Economics  
University of Sussex  
Jubilee Building, Falmer  
Brighton, BN1 9SL, United Kingdom

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