## Programme Overview

**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, Ben Sovacool and Ed Steinmueller.

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

### Wednesday 7 September

<table>
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<th>Time</th>
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<tr>
<td>09.00–09.30</td>
<td>Tea and coffee</td>
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| 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                                                     |

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<td>09.00–10.30</td>
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<td>11.00–12.30</td>
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<td>Lunch</td>
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| 13.30–14.15 | **Panel 3**
                  Rethinking society for the 21st century: Developing a science and technology studies perspective |
| 14.20–15.20 | **Panel 4**
                  Economic policy for innovation and development in Latin America |
| 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

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<td><strong>Parallel Session 8</strong></td>
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<td>15.00–15.30</td>
<td>Break</td>
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<tr>
<td>15.30–17.00</td>
<td><strong>Out of the Box and into the Future: Summary Session</strong></td>
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<tr>
<td>17.00–18.00</td>
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<td>21.00</td>
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DETAILED SESSION PROGRAMME

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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 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) 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@iwgtv.org
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

Welcome to SPRU’s 50th Anniversary Conference

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

Professor in the History of Technology and Sustainability Transitions Studies, Director of SPRU – Science Policy Research Unit, University of Sussex
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
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.”
Panelists:
Jim Watson, SPRU
Kelly Sims Gallagher, Office of Science and Technology Policy, USA
Wolfgang Eichhammer, Fraunhofer Institute for Systems and Innovation Research ISI

Panelists:
Mariana Mazzucato, SPRU
Giovani Dosi, Scuola Superiore Sant’Anna
Luc Soete, UNU-MERIT
Izabella Kaminska, Financial Times

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
PANELS AND PLENARIES

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.

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 session and the follow-up parallel session will contribute to that debate. The report itself will be available for comments before the conference.

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

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, 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

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.
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.
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 MacKenzie, William Walker, Steve Thomas, Bill Nuttall

D • Fulton 202
**DIALOGUE SESSION:**
Policy mixes for innovation: Progress and challenges ahead
Organisers: Karoline Rogge, Florian Kern
Panellists: Rainer Quitzow, Karoline Rogge, Kieron Flanagan, Michael Keenan, Keith Sequiera

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 Torreele, 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 Poit

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 Bonadillo

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-Benoît Joly
Chair: Philippe Larédo
Panellists: Jordi Molas-Gallart, Arthur Mol
TOWARDS A NEW APPROACH FOR INFRASTRUCTURAL INNOVATION: OVERCOMING ASSUMPTIONS OF GOVERNABILITY FOR INCLUSIVE AND RESILIENT URBAN SYSTEMS

Mendel Geizen, Erlii Chu, Luca Bertolini

ACTION SPACE IN TRANSITION TO SUSTAINABLE URBAN WASTE MANAGEMENT

Antje Kötikou, Markus M. Bugge, Arne Fexvolden

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

Jess Britton

TOWARDS A A SOLUTION LOOKING FOR A PROBLEM?

Charles Edquist

A solution looking for a problem?

Joakim Juhl, Sebastian Pfotenhauer

THE ‘DEFICIT MODEL’ OF INNOVATION

Distributed energy storage systems:

Chair: Sabine Hielscher

A solution looking for a problem?

John Juntunen

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

Chair: Marilyn Brown

A solution looking for a problem?

Additive manufacturing in transition:

Chair: Maria Savona

Mabel Sánchez-Barrioluengo, Paolo Giangiacomo, Mário Benassi, Matteo Landoni

MNCs and innovation in emerging markets

Chair: Maria Savona

Additive manufacturing in transition:

Chair: Muhammad Sayyed

The strategic orientation of universities in knowledge transfer activities

Chair: Laurence Williams

Additive manufacturing in transition:

Chair: Durk van der Meulen
THURSDAY 8 SEPTEMBER
11.00–12.30
SESSION 2

2A • Fulton 104
DIALOGUE SESSION:
50 years of science technology and innovation policy in Latin America and beyond
Organiser and Chair: Matías Ramirez-Panellist: Paloma Bernal, Judith Sutz, Gabriela Outenit, 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, 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
Gís 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: Ralitza Hiteva, Kat Lovel, 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 Barté
Six contradictions of the smart-sustainable urban development discourse
Chris Martin, James Evans, Andrew Kavanor
Smart city construction: toward an analytical framework for smart city experimentation
Frans Sengers, Philipp Späth, Rob Raven

2E • Jubilee 115
RESEARCH SESSION:
Investigating unchartered grounds on open innovation: understanding open innovation in SMEs
Organiser: George Tsekouras
Entrepreneurial experimentation: the importance of spinline and acquisition of innovative SMDs
Ásá Lindholm Dahlstråd, Bo Carlsson, Martin Andreasson
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-Schumpetarians value neutral?
Theo Papaoannou, Smita Srivivas
The humanization of the economy through social innovation
René Kemp, Tim Strasser, Marc Davidson, Flor Avellino, Bonno Pel, Adina Dumbrău, Iris Kunze, Julia Backhaus, Tim O’Riordan, Alex Haeckelne, 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 Perina
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 Huventeiter, 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 Srami Gonzalez, Tuukka Mäkitie, Håkan Endresen Normann, Taran Thune, Keith Smith

2I • Jubilee G22
BIG DATA AS A TOOL FOR MAPPING INNOVATION
Chair: Ismael Rafols
New data for innovation policy
Hasan Bakhsh, Juan Mateos-Garcia, Sólan Westlake
Exploring big data value for broadcasters: a qualitative analysis on R&D projects from BBC and NHK
Santiago Ruiz-Navaas, Kumiko Miyazaki
Economic and technological complexity: a model study of indicators of knowledge-based innovation systems
Ingia Ivanova, Oivind Strand, Duncan Kusniit, Loet Leydesdorff

2J • Jubilee G31
MEDICAL INNOVATION
Chair: Ovidya 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 Llopos, Maureen McIveve, Irene Ramos-Vielba, Alfredo Negros, 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 Wakelyn
Sector dynamics and firms demographics of top R&D investors in the global economy
Piero Moncada-Patemon Castillo
The compositional nature of productivity slowdown
Simone Vannuccini, Uwe Canter, Holger Graf
Economies of skill of R&D intensive firms: breaking the law of diminishing marginal returns to labour
Sara Amoroso
### SESSION 3

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  - Fulton 104

#### Panel 3B
- **University-industry tech transfer**
  - Jubilee 115

#### Panel 3C
- **Transitions**
  - Jubilee 116

#### Panel 3D
- **Innovation systems**
  - Jubilee 155

#### Panel 3E
- **Technological trajectories**
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#### Panel 3F
- **Transitions in education**
  - Fulton 202

#### Panel 3G
- **Science policy**
  - Jubilee 144

#### Panel 3H
- **Organisations and innovation**
  - Fulton 203

#### Panel 3I
- **Cross-section interactions**
  - Jubilee G31

#### Panel 3J
- **Natural resource management and technological capabilities**
  - Fulton 113

#### Panel 3K
- **Policy mixes and change**
  - Fulton 103

#### Panel 3L
- **Development income trap**
  - Fulton 144

#### Panel 3M
- **Critical evaluation**
  - Fulton 107

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**THURSDAY 8 SEPTEMBER**

**14.20 – 15.20**

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**SESSION 3**
### SESSION 4

**THURSDAY 8 SEPTEMBER**  
**15.45–16.45**

| 4A  | Fulton 107 | RESEARCH FUNDING AND ORGANISATIONS OF SCIENCE  
**Chair:** Rosane Agou 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  
Adiáno Canaího  
Funding transformative research: ESRC’s challenge to conservatism in peer review  
Peter Kolatz, Erik Arnold |
| 4C  | Fulton 104 | POLITICS OF INCLUSION  
**Chair:** Valéria Arza  
The politics of inclusion: decentralising science, technology and innovation for regional development in Colombia  
Ellsa 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 Fuentschilling, Christian Bltz  |
| 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 Altinnade, Carolina Castald, Onder Nomaler |
| 4H  | 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 |
| 4I  | Fulton 101 | INNOVATION INDICATORS AND PERFORMANCE  
**Chairs:** Chux Daniels and David Walwyn  
Innovation in Africa: Measurement, policy and global issues  
Fred Gault, Aggrey Ambali, Tichaona Mangwezi  
On the origins of patents as an invention indicator: the legacy of early steam navigation entrepreneur and historiography  
Sandro Mendonça |
| 4J  | 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 Renocchini, Thomas Rainwright |
SESSION 5

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 Panelists: Joanna Chatelain, Dinar Kale, Julius Mugaaliga, 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 Fulap
At your service: drawing on evidence in clinical practice
Bryn Lander, Ellen Baika
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 Winkler
Capitalism, technology and a green global golden age: the role of history in helping to shape the future
Carolina Perez
Financing renewable energy: who is financing what and why it matters
Marina Mazzuccato, 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 (PP) 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, Joen Huertafer
Tech to social or social to tech: path dependency and the birth of a new entrepreneurial genre
Mari Coldevin, Veronica Chiado, 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 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 Azza, 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’s Cancer Research
Daniele Rotolo, Michael Hopkins, Nicola Grassano

5J • Fulton 113

GREEN ENTREPRENEURSHIP, INNOVATION AND SKILLS
Chair: Tomas Sälég
Better late than never: a longitudinal quantile regression approach to the interplay of firm growth, green technology and age
Riccardo Leoncini, Alberto Marzucchi, Sandro Montessori, 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

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### Session 6A
**Dialogue Session:** Learning innovation agencies and entrepreneurial ecosystems  
Organiser: José Manuel Leceta  
Chair: José Manuel Leceta  
Panellists: Ben Martin, Charles Edquist, Francisco Martin, Josep M. Piqué, Maríana Mazzucato

### Session 6B
**Dialogue Session:** Innovation in healthcare delivery: What it takes to succeed?  
Organiser: Peter Varnai, Maike Rentel  
Chair: Peter Varnai  
Panellists: James Barlow, Charles Edquist, José Manuel Leceta

### Session 6C
**Research Session:** Intermediary actors in innovation and energy system transition (1)  
Organisers and Chairs: Paula Kivimaa, Anna Bergsk  
Commentator: Wouter Boon

### Session 6D
**Dialogue Session:** R&D responses to external and internal pressures  
Organiser: Tommaso Clarif  
Chair: Richard Nelson  
Commentators: Andrea Raventini and Tim Foxon

### Session 6E
**Research Session:** Innovation in knowledge intensive and creative sectors  
Organisers and Chairs: Mamo Mischke  
Chair: Monica Masucci  
Knowledge intensive entrepreneurship: going beyond the Schumpeterian entrepreneur  
Maureen McKevey, Franco Malerba  
Developing a statistical standard for the creative industries  
Alan Freeman, Hasan Bakshi, John Davies, Peter Higgs, Stuart Cunningham

### Session 6F
**Research Evaluation**  
Chair: Catherine Rhodes

### Session 6G
**Research Session:** The interaction between innovation, employment, inequality, and the environment contrasting evolutionary models on global challenges (1)  
Organiser: Tommaso Clarif  
Chair: Richard Nelson  
Commentators: Andrea Raventini and Tim Foxon

### Session 6H
**Dialogue Session:** Inclusive innovation  
Organiser: José Manuel Leceta  
Chair: José Manuel Leceta  
Panellists: Ben Martin, Charles Edquist, José Manuel Leceta

### Session 6I
**Dialogue Session:** Learning innovation agencies and entrepreneurial ecosystems  
Organiser: José Manuel Leceta  
Chair: José Manuel Leceta  
Panellists: Ben Martin, Charles Edquist, Francisco Martin, Josep M. Piqué, Maríana Mazzucato

### Session 6J
**Dialogue Session:** Innovation in knowledge intensive and creative sectors  
Organiser: José Manuel Leceta  
Chair: José Manuel Leceta  
Panellists: Ben Martin, Charles Edquist, José Manuel Leceta

### Session 6K
**Research Session:** Knowledge intensive entrepreneurship: going beyond the Schumpeterian entrepreneur  
Maureen McKevey, Franco Malerba  
Developing a statistical standard for the creative industries  
Alan Freeman, Hasan Bakshi, John Davies, Peter Higgs, Stuart Cunningham

### Session 6L
**Research Evaluation**  
Chair: Catherine Rhodes

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Friday 9 September
13.30–15.00

Session 7

7A Dialogue session
Jubilee 155

7B Research session
Fulton 104

7C Research session
Jubilee 116

7D Research session
Jubilee 144 LT

7E Research session
Jubilee 115

7F Regional and urban politics of innovation
Fulton 107

7G University-industry relations
Fulton 202

7H Electric mobility
Fulton 103

7I Evaluating innovation impact
Jubilee G31

7J Green entrepreneurship, innovation and skills
Jubilee G22

7A • Jubilee 155
Dialogue session
Jubilee 155

7B • Fulton 104
Research session
Fulton 104

7C • Jubilee 116
Research session
Jubilee 116

7D • Jubilee 144 LT
Research session
Jubilee 144 LT

7E • Jubilee 115
Research session
Jubilee 115

7F • Fulton 107
Research session
Fulton 107

7G • Fulton 202
Research session
Fulton 202

7H • Fulton 103
Research session
Fulton 103

7I • Evaluating innovation impact
Research session
Jubilee G31

7J • Green entrepreneurship, innovation and skills
Research session
Jubilee G22
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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 Steinmüller, Daniele Archibugi
Chair: Saurabh Arora
Panellists: Daniele Archibugi, Raïtia Hitova, Ed Steinmüller, Caroline Bassett

8C • Jubilee 155

**RESEARCH SESSION:**

Innovation and industrial performance: firm level analysis

Organiser: Federico Tamagni
Discussant: Angelo Secchi

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 Guarrascio, 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 Serlic

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: Sungwoo Lee

The echoes of bandwagon through a complex system of innovation and development

João Basílio Perelma, 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 UPGRAADING**

Chair: Raphael Kaplinsky

Capturing up with the international oil firms: a Penrosean view of upgrading and innovation barriers in china’s refining industry

Damian Tabin

Technology upgrading of middle-income economies: a new framework and evidence

Slavo Radosavic, Esin Yoruk

8G • Jubilee 22

**PUBLIC FORESIGHT AND ENTREPRENEURSHIP**

Chair: Markku Wilenius

Entrepreneurial ecosystems: the role of government alliances as drivers of innovation

Claudia Doblinger, Kavita Suranaa, Laura Díaz Anadona

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

Matteo Landoni

Forward looking innovation policy: insights from foresight experts

Soft 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 organisations-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 Urzúa, 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, Kabo Py Leung

8J • Jubilee 144

**FLIRTING WITH KNOWLEDGE**

Chair: Josh Stiepel

It takes more than two to tango: building up linkages between Non High-tech SMEs and Universities

George Tsikouras, 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

**FIRST FLOOR**

- Jubilee Atrium
- G31 Refreshment area and exhibitor stands
- G35 Luggage Room
- G36 Lunches
- BMEc School Office
- Main entrance
- Conference entrance
- Registration Desk
- Café

**GROUND FLOOR**

- Jubilee Atrium
- G31 Refreshment area and exhibitor stands
- G35 Luggage Room
- G36 Lunches
- BMEc School Office
- Lifts

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