



Mathematical Sciences Team Visit

Queen Mary University London, 15 February 2019

Dr Katie Blaney



Why are we here?

- ■ ■ To share EPSRC strategy and priorities
- ■ ■ To find out and understand your strategy and priorities at University and portfolio level
- ■ ■ To meet academics in the Maths community
- ■ ■ To share our thinking on Maths related topics

Contents

■ Meet the team

■ UKRI overview

■ EPSRC and the Strategic Delivery Plan

■ Mathematical Sciences

Mathematical Sciences Team Responsibilities

Katie Blaney (Theme Lead)

Theme strategy
Theme budget
Isaac Newton Institute

Matthew Lodge (Senior Portfolio Manager)

Leadership in Mathematical Sciences
International Strategy
International Centre for Mathematical Sciences

Ruqaiyah Patel (Senior Portfolio Manager)

Artificial Intelligence
Strategic Advisory Team
Programme Grants

Ruvimbo Gamanya (Portfolio Manager)

Applied Mathematics and Mathematical Biology
Balancing Capability - Buddy
GCRF Call
Remit queries

Laura McDonnell (Portfolio Manager)

Statistics and Applied Probability and Operational Research
Accelerating Impact - Lead
New Investigator Awards
Strategy workshop

Thomas Robinson (Portfolio Manager)

Pure Mathematics
Balancing Capability - Lead
E,D&I - Lead
Fellowships

Joseph Westwood (Portfolio Manager)

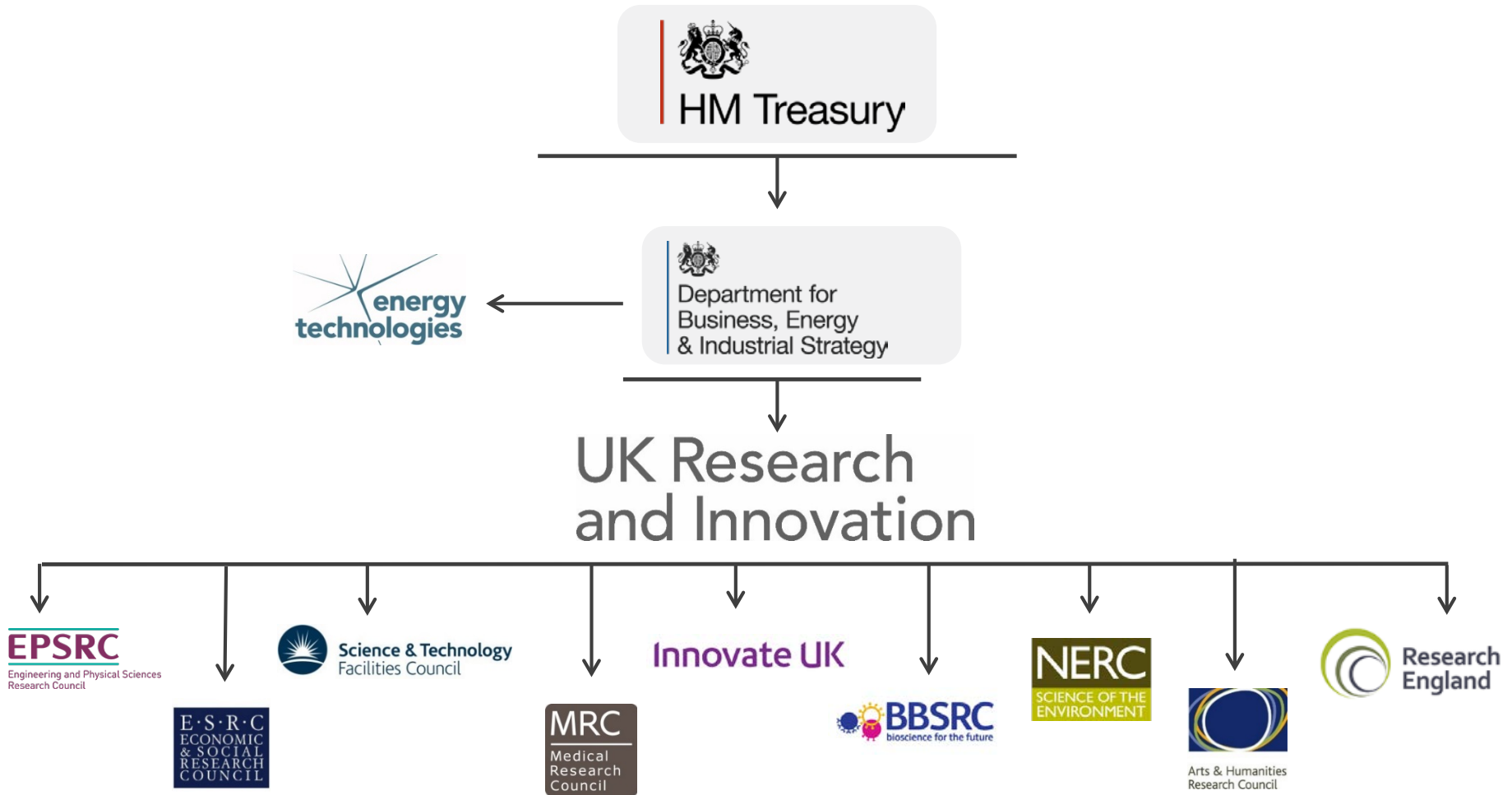
Mathematical Analysis and Mathematical Physics
Accelerating Impact - Buddy
Early Career Forum
E,D&I - Buddy



UK Research and Innovation (UKRI)



The UKRI Family



EPSRC is still evolving as part of UKRI

Industrial
Strategy
Challenge Fund

Strategic
Priorities Fund

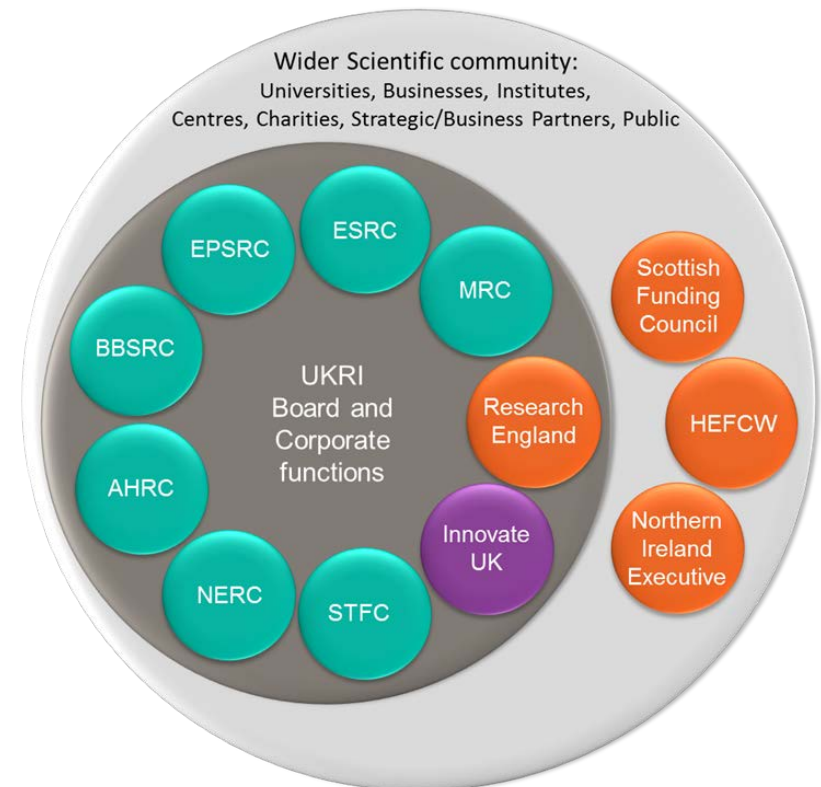
Fund for
International
Collaborations

Strength in
Places Fund

Talent and Skills
Funds

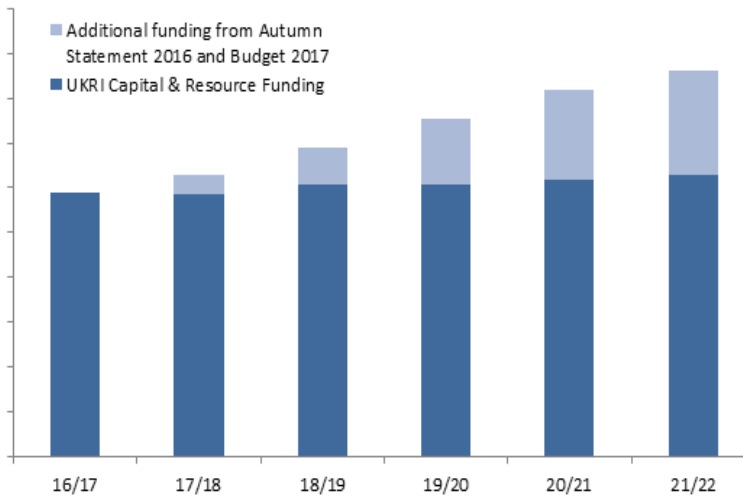
Global
Challenges
Research Fund

- Greater **strategic vision** for UK science
- Providing a **stronger voice** into Government in support of UK science
- Creating greater space for individual Research Councils to put **more effort into science** (and less into back-office)
- Enabling **greater co-ordination** including for interdisciplinary research
- Improved **policy for science** and improved **science for policy**



UK Research and Innovation: £4.7 billion more for R&D

Illustrative UKRI budget 2016/17 to 2021/22



In the 2016 Autumn Statement **£4.7bn of additional funding for R&D** was announced, with a rising profile, over the period 2017/18 to 2020/21.



R&D
SPENDING

This increase in funding, if baselined at an additional **£2bn per annum**, is likely to halt the decline in R&D investment as a percentage of GDP (currently around 1.7%).

The Government published its Industrial Strategy White Paper in November 2017

UKRI will deliver a further **£725m through ISCF** over the next three years, including through **six new wave two challenges**, and **two pioneers**

An investment of **£300m** over the next three years in world-class **research and innovation talent**, including additional PhD and KTP places, and prestigious awards that support rising stars and the top talent from both the UK and overseas

UKRI will work the Government to develop a new competitive **Strategic Priorities Fund**, which builds on the vision of a 'common fund' set out in Sir Paul Nurse's review

**THE WHITE
PAPER**



A new **£115m Strength in Places Fund** to support areas across the UK to build on their science and innovation strengths

An investment of **£300m** over the next three years in world-class **research and innovation talent**, including additional PhD and KTP places, and prestigious awards that support rising stars and the top talent from both the UK and overseas

The Industrial Strategy also sets out four **Grand Challenges** to put the UK at the forefront of the industries of the future: Growing the Artificial Intelligence and Data Driven Economy, Clean Growth, Future of Mobility and our Ageing Society.

The Government will also announce **Sector Deals** in construction, life sciences, artificial intelligence and automotive industries.

**THE WHITE
PAPER**



Maximising opportunities within NPIF

Strategic Priorities Fund

To support
research across
disciplines

£580M



Talent and Skills

To support world-
class research and
innovation talent

£300M



ISCF

To tackle the big
societal and
industrial challenges
of today

£725M



Fund for International Collaboration

To enhance the UK's
excellence in
research and
innovation through
global engagement

£110M



Strength in Places Fund

To support areas
across the UK to
build on their science
and innovation
strengths

£115M



All figures are indicative and over period 2017-2020

Money into EPSRC research

Over £300M total additional investment won through NPIF and rising

Strategic
Priorities Fund

£89M awaiting ministerial approval

Talent and
Skills

£4.5M for 80
Innovation
Fellowships

£60M for 650
doctoral places

£39M for Research Talent

ISCF

£42M for RAI
in extreme
environments

£78M for
Faraday Battery
Challenge

£36M for
Transforming
Construction

£12M for Prospering
from the Energy
Revolution

Getting ready for UKRI: the Big Ideas framework

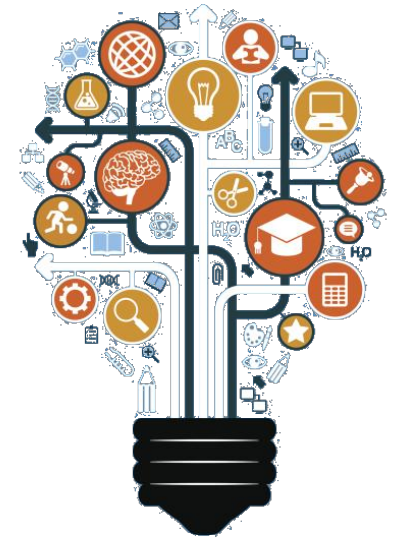
EPSRC has launched a framework to identify, prioritise and develop Big Ideas from conception to business case.

What's a Big Idea?

- A Big Idea is an **adventurous** and **exciting** idea from the research community that will have the ability to enthuse the public and Government, and that will be **transformative** or **enabling** if successful.

Why...?

- We are in a dynamic environment which is shaped by fiscal events and emerging priorities.
- The Big Ideas framework looks to create a pipeline of ready-to-go ideas suitable for when future funds may emerge and to support the articulation of challenges and fundamental ideas in a way that matches the ambitions and vision of UKRI.





EPSRC's Delivery Plan: Progress and Next Steps



1

ONE VISION

Our vision is for the UK to be the best place in the world to research, discover and innovate

2

TWO GOALS

Research and
Discover

Research and
Innovate

3

THREE STRATEGIES

Balancing
Capability

Building
Leadership

Accelerating
Impact

EPSRC's Delivery Plan – Progress to Date: our strategies

BALANCING CAPABILITY

- Published balancing capability results, confirming the suggested future strategies for these **areas over the next five years**
- Worked with our advisory bodies and the wider community to **refresh the 111 research areas** that make up the building blocks of our portfolio

BUILDING LEADERSHIP

- Continued investment in doctoral training – **single largest funder of PhDs**
- Allocated **£92 million per annum** over the next two years through the Doctoral Training Partnerships
- Allocate **£17 million** of EPSRC funds per annum to support **200 Industrial CASE** students

ACCELERATING IMPACT

Facilitating relationships through

- Impact Acceleration Accounts
- **Prosperity Partnerships**
- Business Engagement Forum

11 Prosperity Partnerships

- £3 million EPSRC investment
- £11 million university investment
- £36 million industry investment

OUR STRATEGIES

What is the Strategic Delivery Plan?

- Legal requirement of the HER act
 - Align to the UKRI Strategic Prospectus
 - An articulation of our strategy for the period 2019 to 2020
 - It should include a forward view (5-10 years)
- Audience:
- 1^o UKRI & Government;
 - 2^o Research & Industry Community, the public, etc.
- Not a bidding document but is aligned to the 2019 Spending Review

Strategic Delivery Plan

Principles of the Project

■ To put forward a vision/case that:

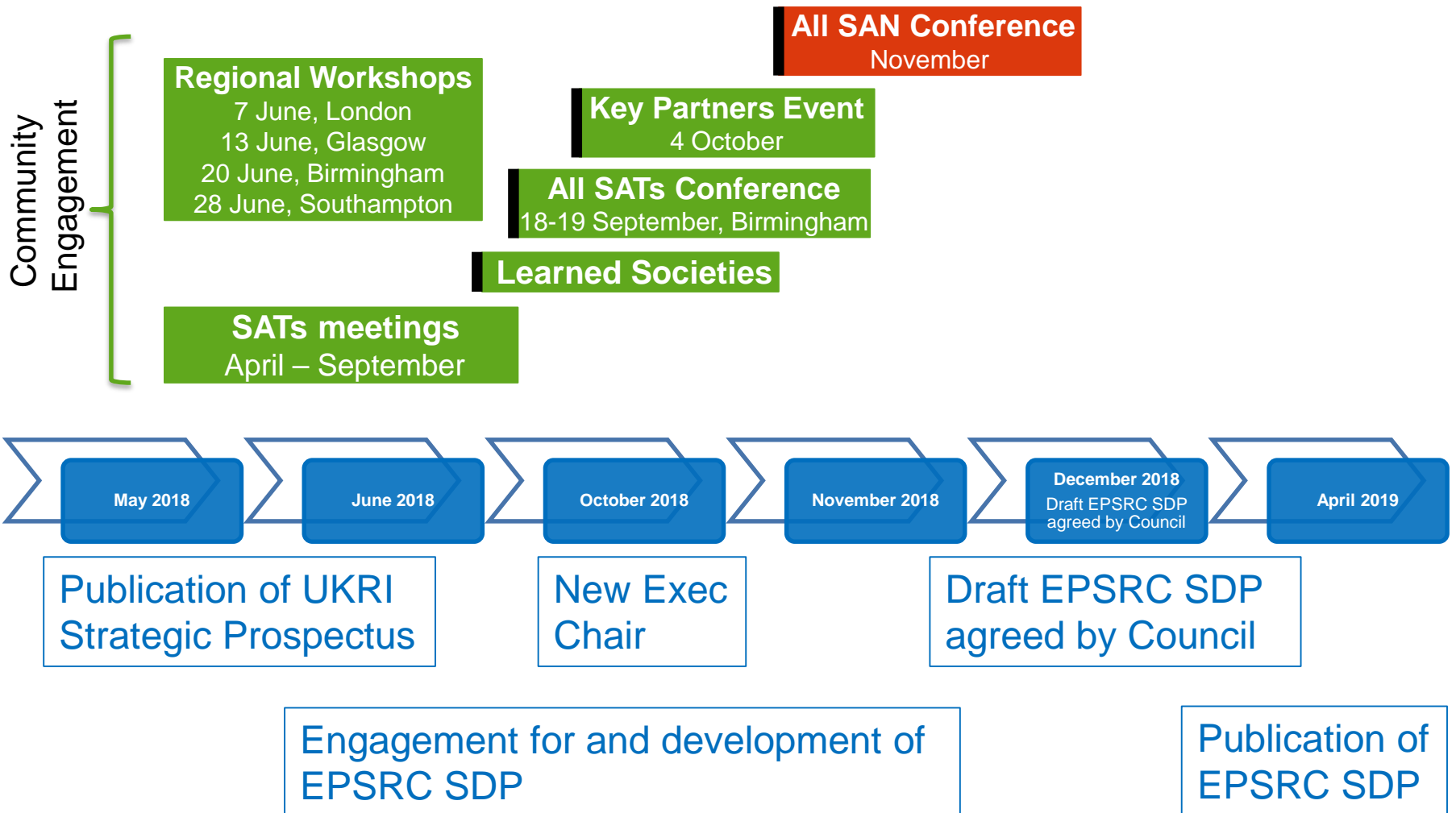
- Improves the long-term capability and capacity of world-leading EPS research and innovation for the benefit of the UK
- Strengthens effective multidisciplinary approaches, across EPS disciplines and UKRI partners, to the challenges society faces
- Champions the most effective, strategic interventions to deliver world-leading research and influence the research and innovation ecosystem
- Demonstrates the value of EPSRC, and the potential of EPS research, to address the challenges identified by other UKRI councils and government departments

■ To communicate clearly:

- Desired outcomes from our investment
- How we will measure success
- How we have maximised opportunities within a changing landscape

Strategic Delivery Plan

Timeline of Activities





Mathematical Sciences



Aim of Mathematical Sciences at EPSRC

Encourage strengthening of connections to other disciplines and to industry

Work to secure the pipeline of future talent through doctoral training and targeted support for individuals

Our aim is to sustain core research capability across the breadth of mathematical sciences while promoting transformative and cross-disciplinary research all of which has the potential for significant impact

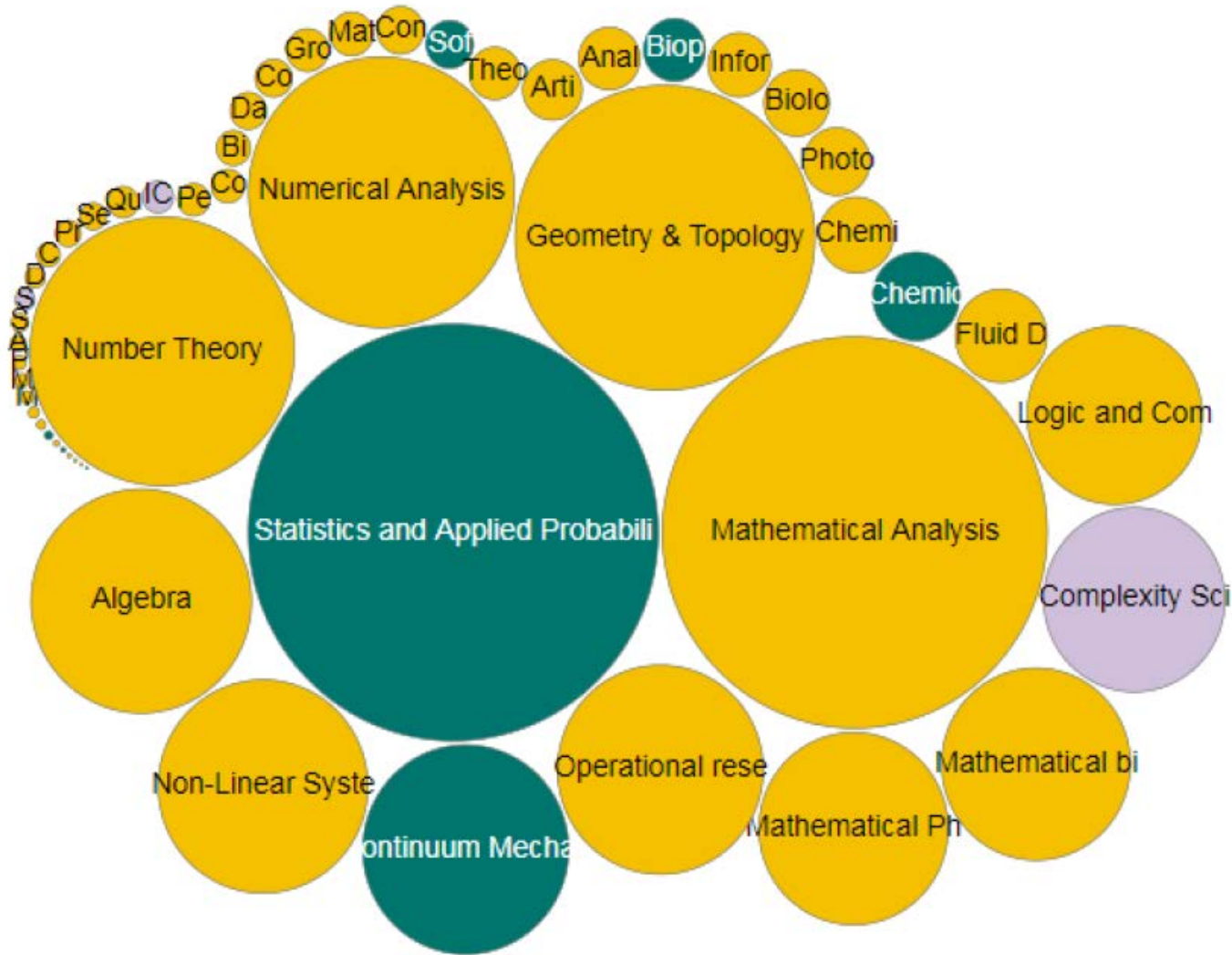
Actively manage the balance of the Mathematical Science portfolio with input from our stakeholders

Inform the Mathematical Sciences Community of opportunities within the UKRI funding landscape

Maths Team Priorities for 2018

- Community engagement including team visits
- Developing strategy with the SAT
- Strategy Workshop
- Developing our relationship with the Early Career Forum
- Continued support for leading researchers (Fellowships and Programme Grants)
- Equality, Diversity and Inclusion
- Accelerating Impact
- International working
- Leadership in Mathematical Sciences
- Monitoring the balance of the portfolio
- GCRF Call

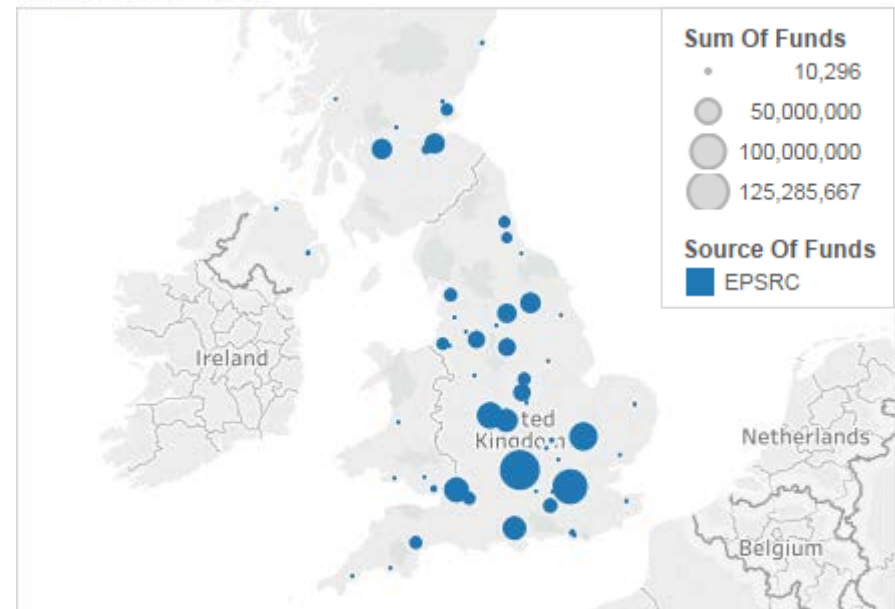
Mathematical Sciences – Balancing Capability



What has the Mathematical Sciences theme funded?

- 288 live grants with a proportion of Maths coding
- Across 52 different research areas (13 Maths-led areas)
- At 47 Universities
- With 195 collaborating partners

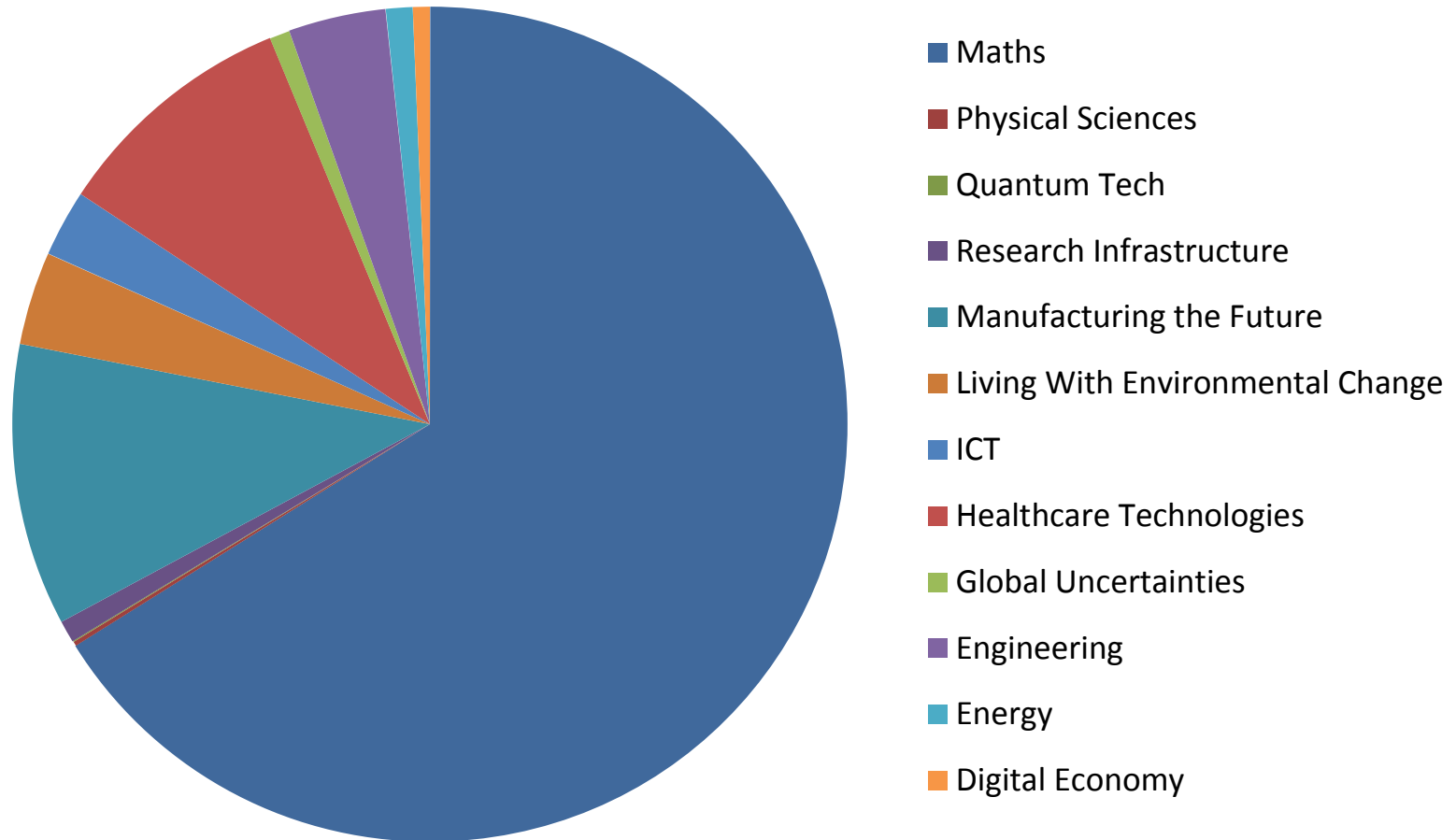
ThemeEPSRCMap



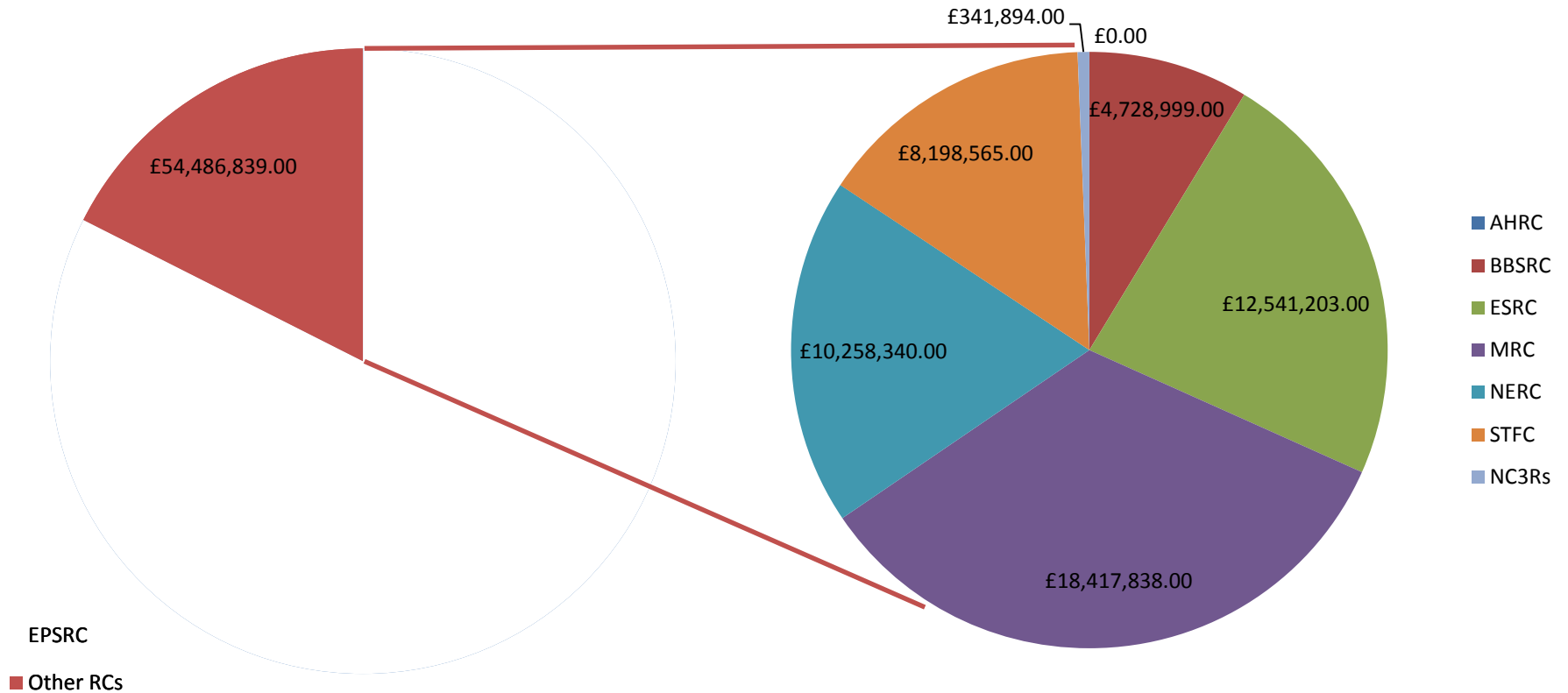
Map based on Longitude (generated) and Latitude (generated). Color shows details about Source Of Funds. Size shows sum of Sum Of Funds. Details are shown for Holding Organisation Name and Short Post Code. The data is filtered on Theme, which keeps Mathematical Sciences. The view is filtered on Source Of Funds and sum of Sum Of Funds. The Source Of Funds filter keeps EPSRC. The sum of Sum Of Funds filter ranges from 4,883 to 472,877,262.

Note: Map generated from 2015 data.

Interdisciplinary research in the Mathematical Sciences



RCUK Funding for Mathematical Sciences



International

- GCRF Call currently in progress
- Additionally, a US visit is being planned for April
- This will include visits to Government departments as well as funded Centers in Maths
- Looking for opportunities to form collaborations or to form agreements with US colleagues

■ ■ ■ Pathways to Impact

■ ■ ■ Impact Acceleration Accounts

■ ■ ■ Researchfish

■ ■ ■ Case Studies

■ ■ ■ Review of Knowledge Exchange



Fellowship Priority Areas for Maths

Postdoctoral	Early Career	Established Career
Statistics and Applied Probability	Statistics and Applied Probability	Statistics and Applied Probability
Intradisciplinary Mathematics	Intradisciplinary Mathematics	
New Connections from Mathematics	New Connections from Mathematics	New Connections from Mathematics
Continuum Mathematics and Advanced Materials in the Mathematical Sciences	Continuum Mathematics and Advanced Materials in the Mathematical Sciences	
Mathematical Aspects of OR	Mathematical Aspects of OR	

||| **4 months** minimum required for processing and peer review

||| Prioritisation panels in **November** and **June**

||| Fellowship priority areas are considered in partnership with the SAT on an annual basis. Please check the website regularly for updates.



Mathematical Sciences: Strategic Advisory Team

- ||| Professor Veronica Bowman - Defence Science and Technology Laboratory
- ||| Dr Jeremy Bradley – Royal Mail Group Ltd
- ||| Professor Jonathan Dawes - University of Bath
- ||| Professor David Evans - Cardiff University
- ||| Mr Adrian Jonas - Nice
- ||| Professor Stephane Launois - University of Kent
- ||| Professor Paul Linden - University of Cambridge
- ||| Professor Sara Lombardo – Loughborough University
- ||| Dr Sean McGinty – University of Glasgow
- ||| Professor Graham Niblo - University of Southampton (CHAIR)
- ||| Professor Carmen Molina-Paris – University of Leeds
- ||| Professor Nick Polydorides – University of Edinburgh
- ||| Professor Vicky Pope – Met Office
- ||| Professor Michael Singer - University College London
- ||| Dr Almut Veraart - Imperial College London
- ||| Professor Konstantinos Zografos - Lancaster University



Early Career Forum

- The Mathematical Sciences Early Career Forum acts as an informal advisory stream to EPSRC
- Members are advocates for EPSRC within the community, and provide a broad perspective of the needs and views of the mathematical sciences community, offering opinion across the breadth of the Theme
- The Mathematical Sciences Theme considers it important that the Forum shapes its own agenda and activities, suggesting items of discussion and providing relevant insight and feedback to EPSRC from the community they represent
- The Mathematical Sciences Team is evolving its approach to the Early Career Forum to make this a more strategic group who can feed their thinking into SAT discussions
- New Early Career SAT member appointment will also sit on the Forum
- Overall membership level has been decreased to allow for more structured discussions

Thank you

Questions?

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