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Physical Sciences
Research Council

Welcome





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EPSRC ICT Team Visit

University of Glasgow – 15 June 2022





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UKRI Overview and Strategy

Dr Glenn Goodall – Head of ICT Research Portfolio

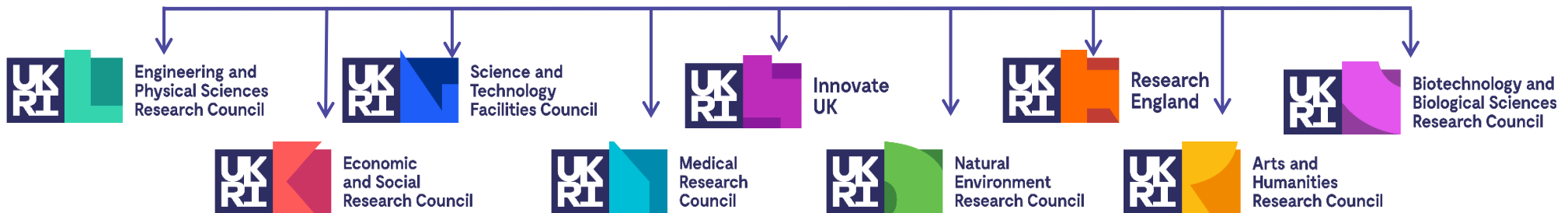
UK Research and Innovation



**Professor Dame
Lynn Gladden**
EPSRC
Executive Chair



**Professor Dame
Ottoline Leyser**
UKRI Chief
Executive



Strategic Update

UKRI Strategic Objectives

Make the UK the most attractive destination for talented people and teams from the UK and around the world.

Advancing the frontiers of human knowledge and innovation by enabling the UK to seize opportunities from emerging research trends, multidisciplinary approaches and new concepts and markets.

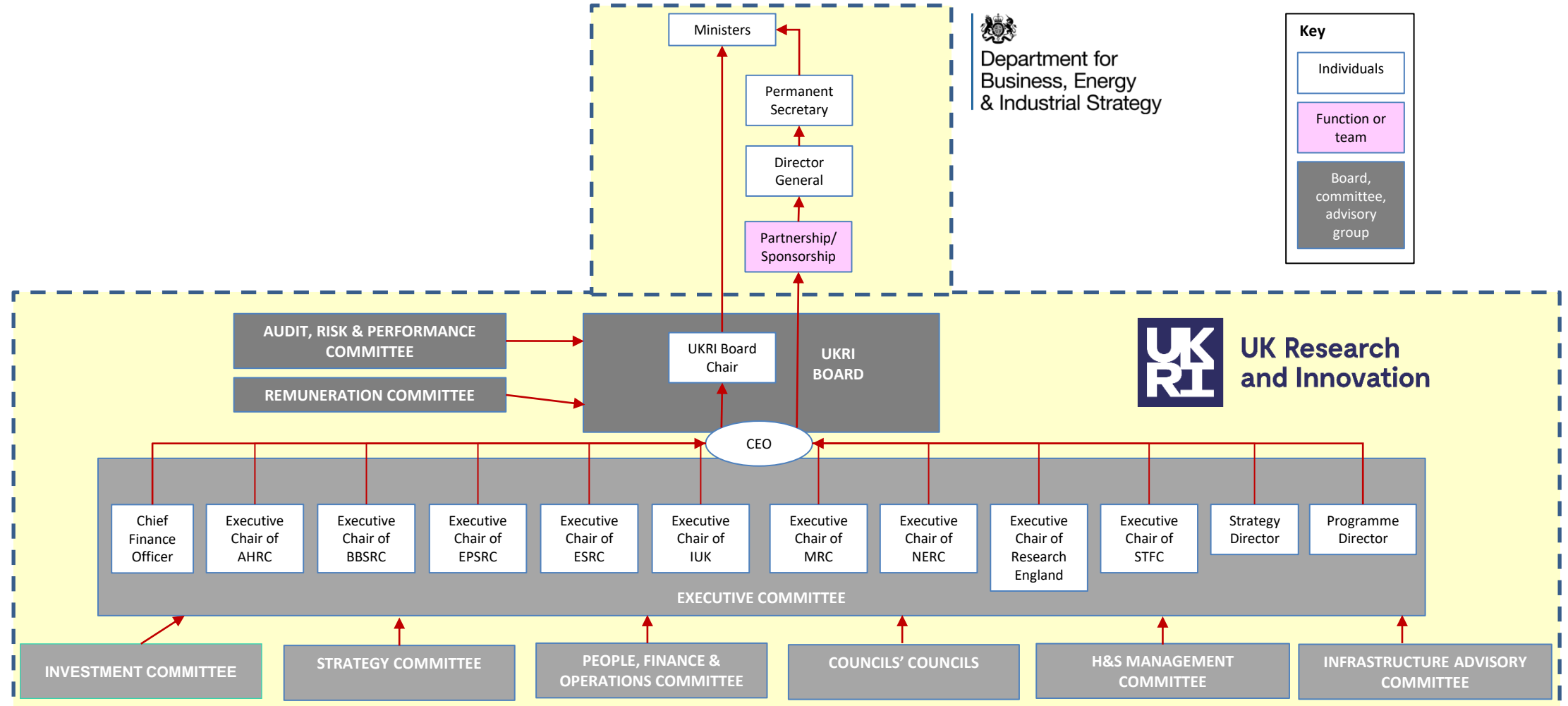


Securing the UK's position as a globally leading research and innovation nation with outstanding institutions, infrastructures, sectors and clusters across the breadth of the country.

Delivering the government's vision for the UK as an innovation nation, through concerted action of Innovate UK and wider UKRI.

UKRI Governance Structure:

Our senior governing body



* The Chief People Officer also attends ExCo



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EPSRC Delivery Plan 2022-2025

Dr Glenn Goodall – Head of ICT Research Portfolio

EPSRC's Strategic Priorities

Discovery Led Research

The Physical and Mathematical Sciences Powerhouse: curiosity driven discovery, with boundless potential

Frontiers in Engineering and Technology: unleashing our productivity potential

Digital Futures: the future of communications, computing and the internet

Mission Inspired Research

Engineering Net Zero: decarbonising our economy and society, creating an alternative energy future and developing truly circular economies

AI, Digitalisation and Data – Driving Value and Security: powering transformative change and the next industrial revolution

Transforming Health and Healthcare: improving quality of life through innovative technological solutions

Quantum Technologies: realising the transformative impact of this technology across business, government and society

International

Talent and Skills

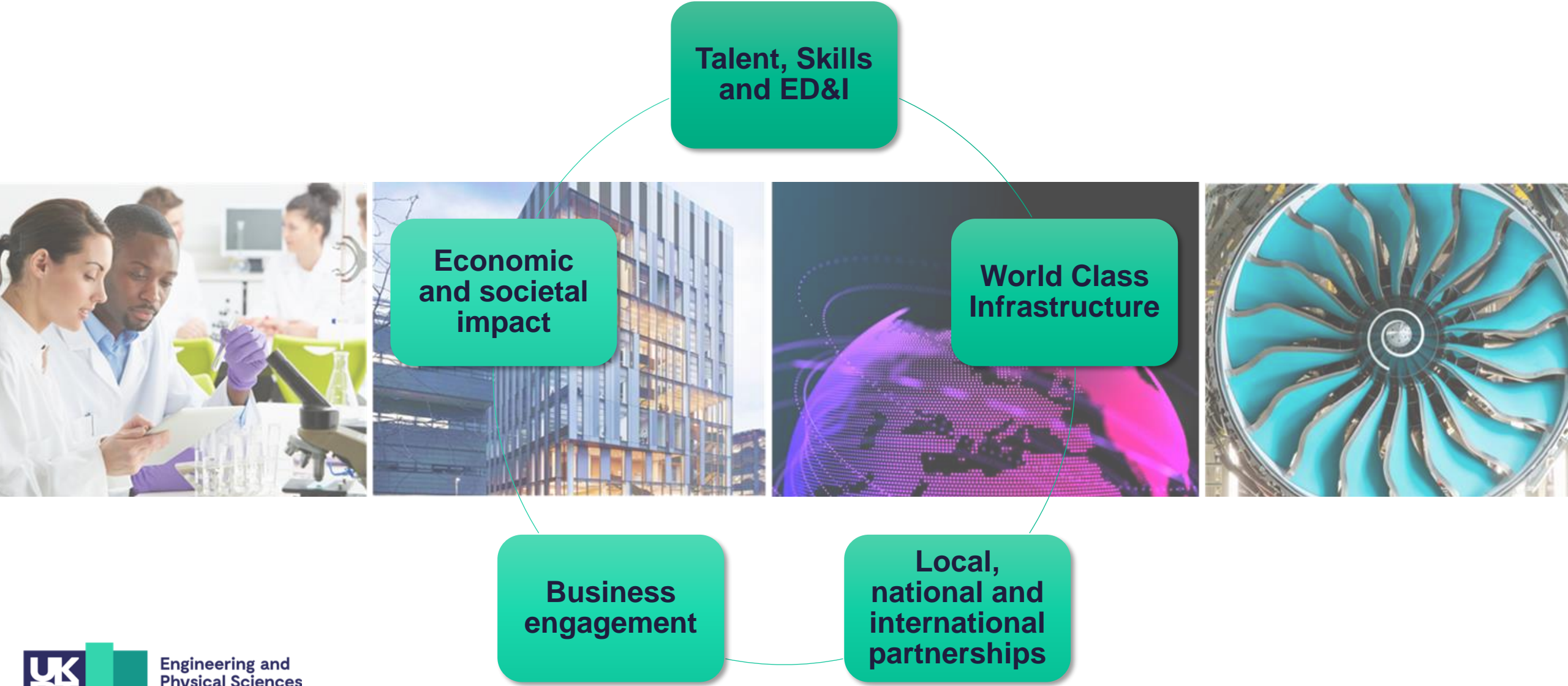
Place

World Class Infrastructure

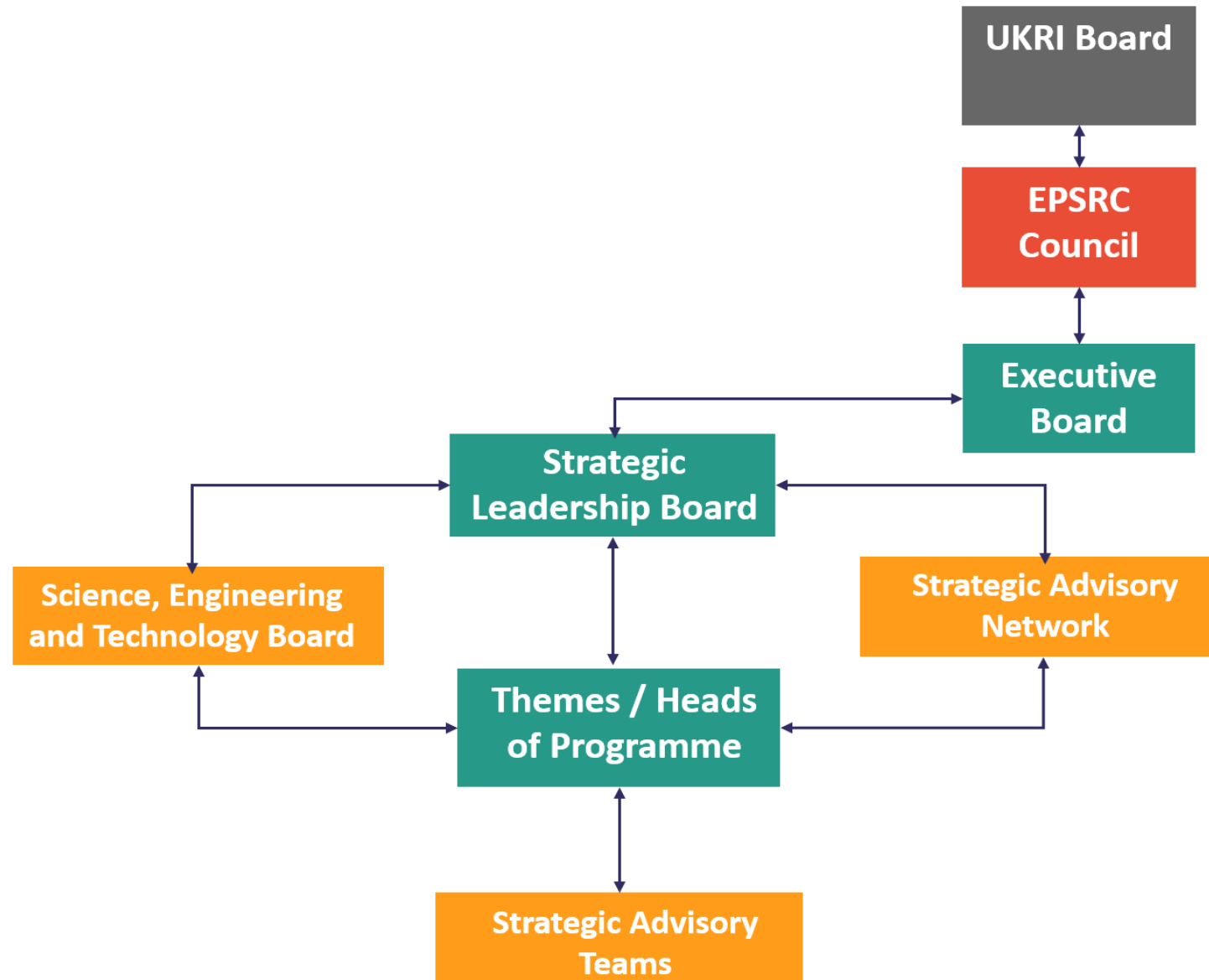
Impact

Business Engagement

Creating an Effective Ecosystem for EPS



EPSRC External Governance





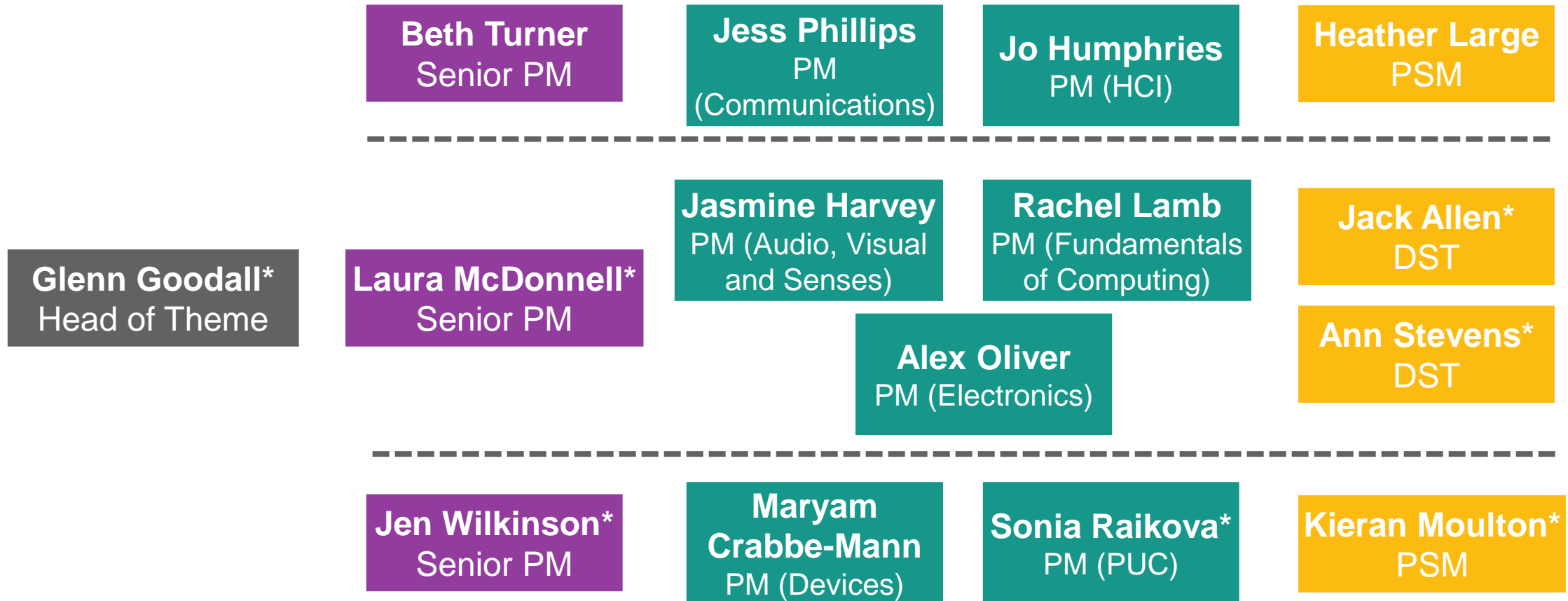
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EPSRC ICT Theme

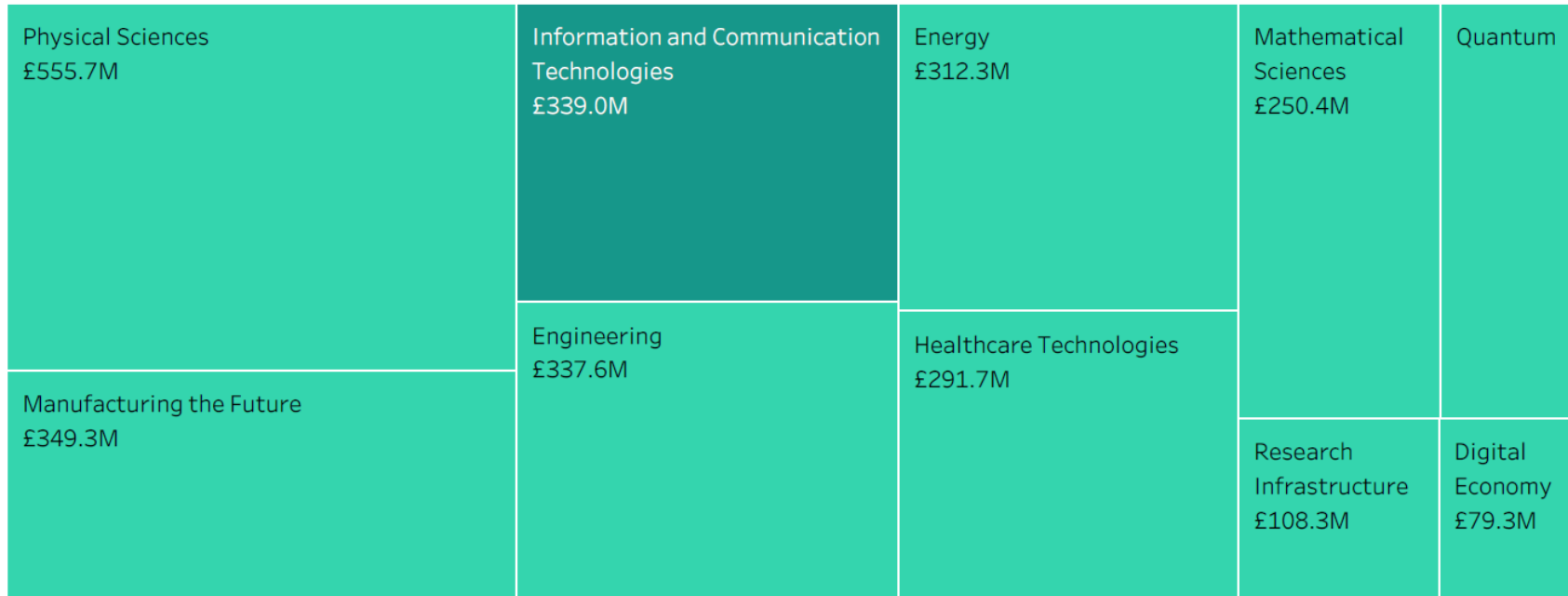
Dr Glenn Goodall – Head of ICT Research Portfolio

ICT Team Members

Team Structure



ICT Theme at EPSRC



- CDT
- Discipline Hopping
- Fellowship
- Managed Activity
- Network Grant
- New Investigator
- NRF
- Platform Grant
- Programme Grant
- Standard Grant
- Travel Grant

ICT is the third largest portfolio in EPSRC, with...

- £339m in committed funds
- 478 live grants



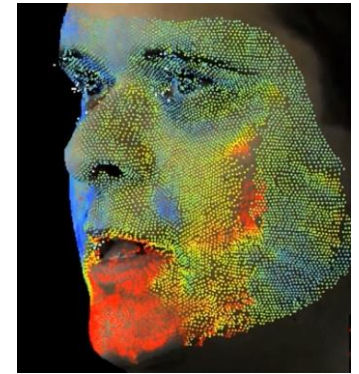
AI*



Photonics



NLP



**Image, Vision,
Speech and Sound**



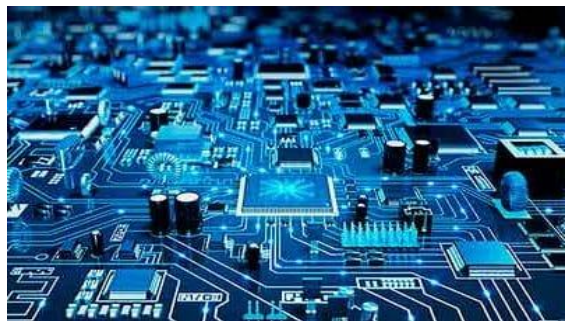
Internet of Things



Cybersecurity*



Software engineering



Electronics



**Human Computer
Interaction**



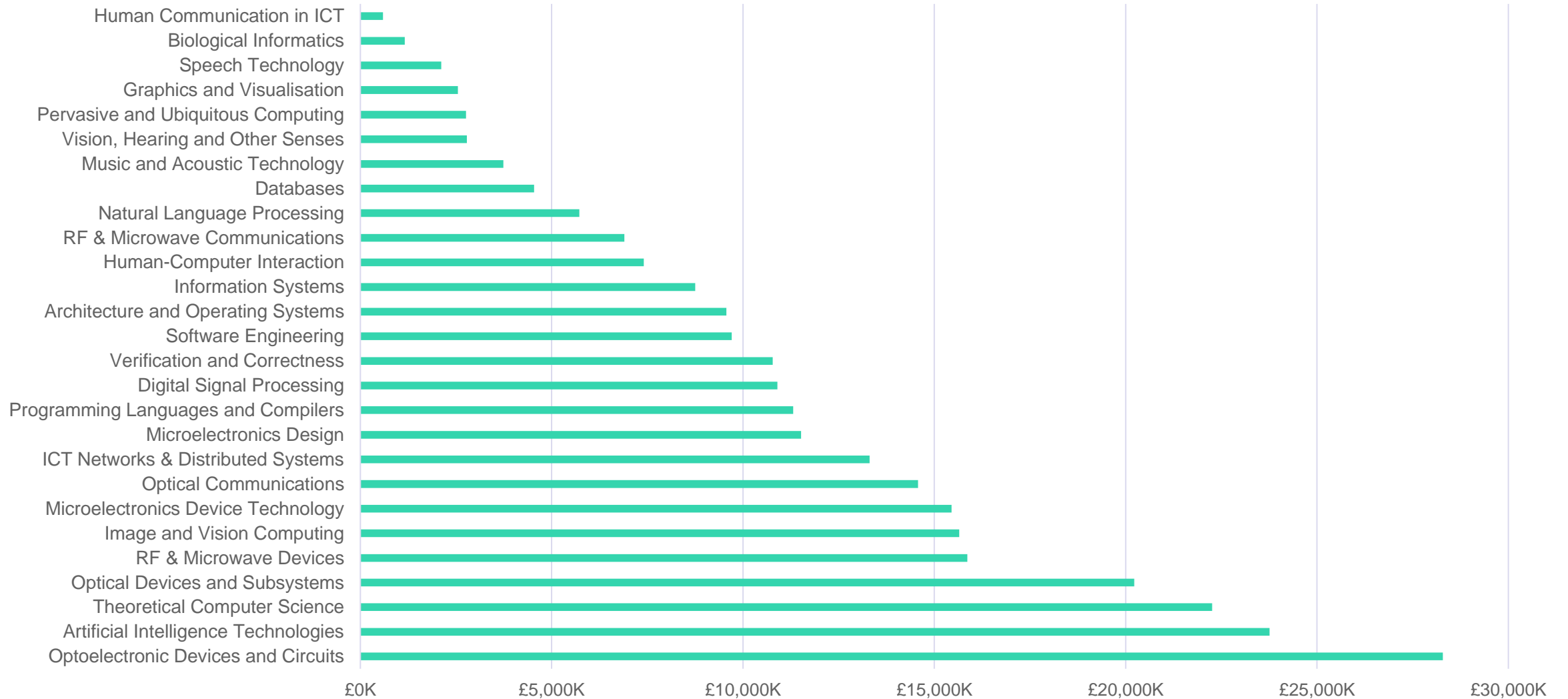
Communications



Fundamentals of Computing

Portfolio Update

Committed funds by research area – As of February 2022



Cross-ICT Priorities

Cross-cutting priorities

Delivery Plan, Digital Futures - Ambitions

Next Generation Computing

- New and emergent ideas and technologies
- Neuromorphic and quantum computing
- Future Internet
- Creative industry and technology

Sustainable ICT

- Reduce energy and resource consumption across digital systems
- Driven by low-powered design – “*Better Chips for a Better Future*”
- Sustainable Digital Society

Future Communications Systems

- Development of future communication systems (inc. networks, satellite, wireless, wired technology)
- Bolstering the UK’s communications sovereign capability
- Human centred / user co-created

People at the heart of ICT

Enabling the pipeline of interdisciplinary, human centred, user co-created ideas in ICT.

Towards an equitable digital society.

AI and Data Science

Future intelligent technologies and data enabled decision making.

Beyond a data driven economy.

Digital Security & Trust

Enabling safe and secure ICT infrastructure and technology - including verifiability and trust of network intelligence, native security and trust, physical layer security, etc.



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Funding Opportunities

Dr Glenn Goodall – Head of ICT Research Portfolio

Strategic Update

Spending review

- In March 2022, BEIS confirmed a total budget of **£25.1 billion** for the three financial years **2022-23 to 2024-25**.
- **Multi-year budget** for all parts of UKRI - security to **plan strategically** as we deliver our five-year UKRI Strategy: transforming tomorrow together.
- **Leverage the strength and breadth** of investments in R&I across our Councils.



Strategic Update

Spending review

- Work collectively across £2bn of talent initiatives, covering studentships and fellowships.
- This allocation will maintain the balance to dual support, providing stability of funding for higher education institutions, we will maintain the balance of dual support.



	Total £m							
UKRI budgets	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Total	6,768	6,842	6,957	8,188	7,785	7,904	8,373	8,874



Strategic Update

Delivering the UKRI Strategy

Delivering the UKRI Strategy: total funding allocations, 2022-23 –2024-25

Arts and Humanities Research Council £207m	Biotechnology and Biological Sciences Research Council £944m	Engineering and Physical Sciences Research Council £1,929m
Economic and Social Research Council £362m	Medical Research Council £1,750m	Natural Environment Research Council £925m
Science and Technology Facilities Council £1,651m	Research England £6,227m	Innovate UK £2,438m
Infrastructure £3,053m	Existing time limited commitments and Centrally Managed Funding* £3,674m	Collective Talent Funding and new cross-UKRI Strategic Programmes £2,805m

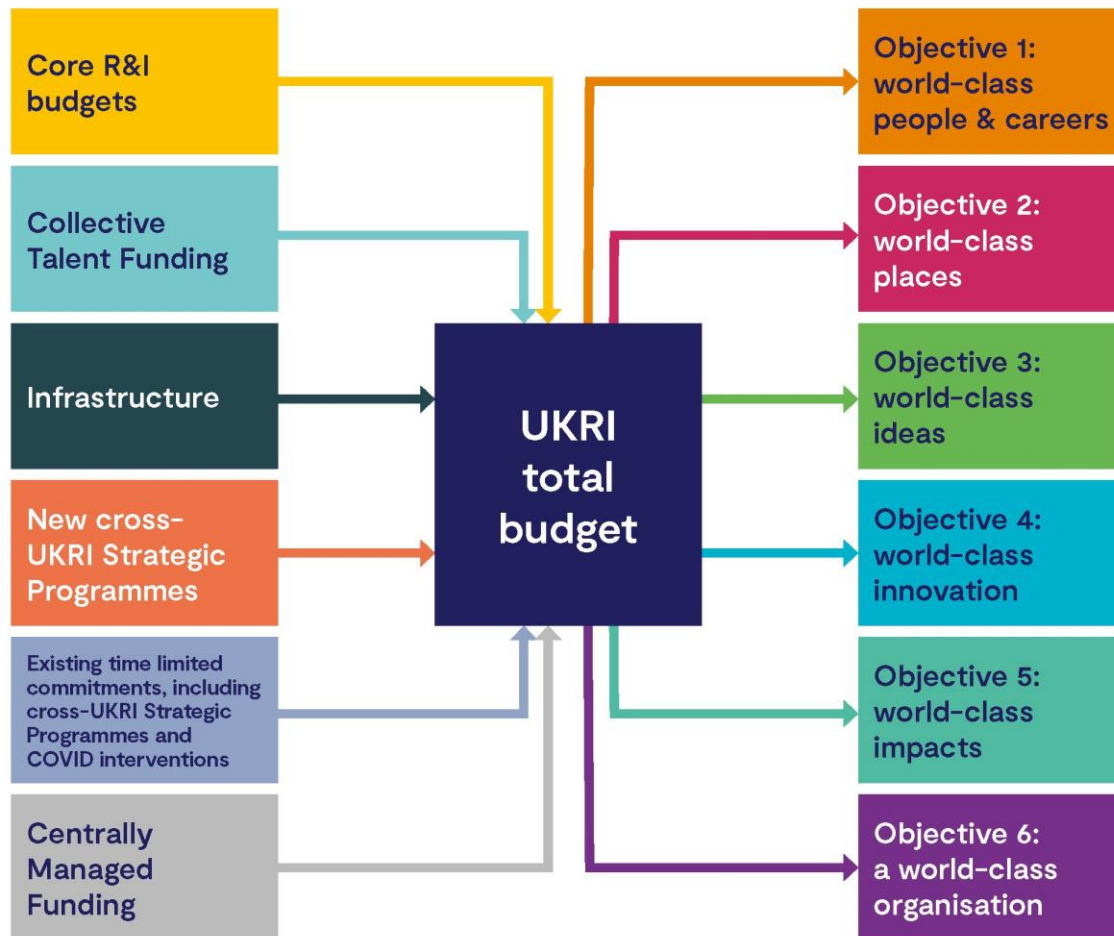


*includes existing cross-UKRI Strategic Programmes (and other time limited commitments such as COVID interventions), support for UKRI transformation, public engagement, and open access

Strategic Update

Supporting our strategic objectives

UKRI's total budget comprises investment across key spend areas that individually and collectively support multiple priorities within our six strategic objectives



This Autumn, we will publish our Corporate Plan and our council Strategic Delivery Plans which will provide further details on our three-year plans to start delivering our Strategy.

It will demonstrate how we will convene, catalyse and invest in R&I ideas and impacts at all stages and in the people, places and infrastructures that deliver them.

Update on CDT Call

- We confirm that we are planning for new investments in Centres for Doctoral Training
- This will support student cohorts starting from the 2024/25 academic year
- We are developing details and hope to say more by October 2022
- We are not likely to support as many CDTs as previously (due to an overall constrained budget, and increasing costs)
- The following will remain key features of any call:
 - The need for cohort training, and not just volume
 - The need for EPSRC investment in the proposed area
 - The ability to leverage further investment

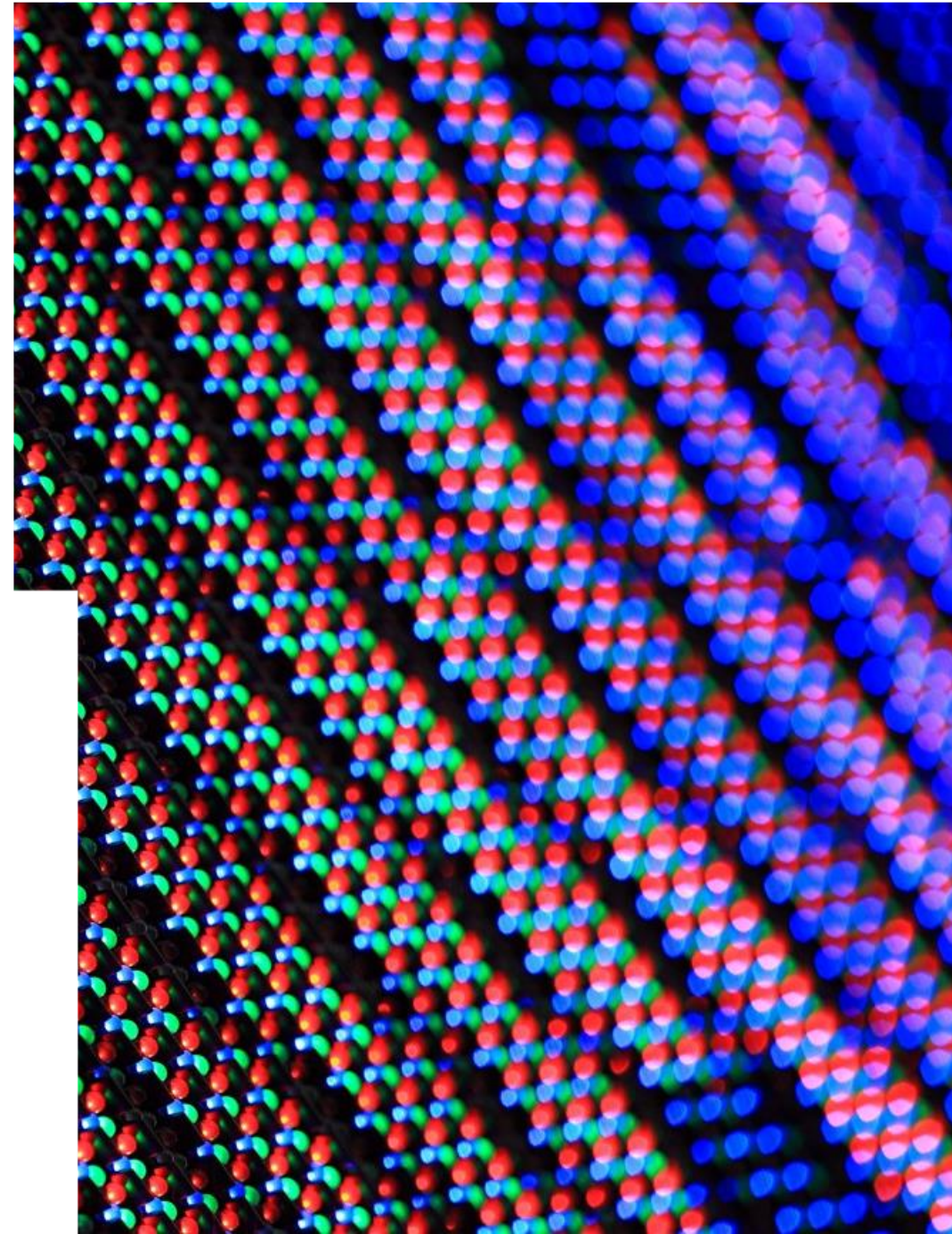


EPSRC Funding Delivery

General Opportunities Overview

Routes to funding:

- Standard Mode – Five panels a year (between £500k to £800k)
- New Investigator Awards / NIA (ca. £300k)
- Programme Grants (up to £6m)
- Open Fellowships

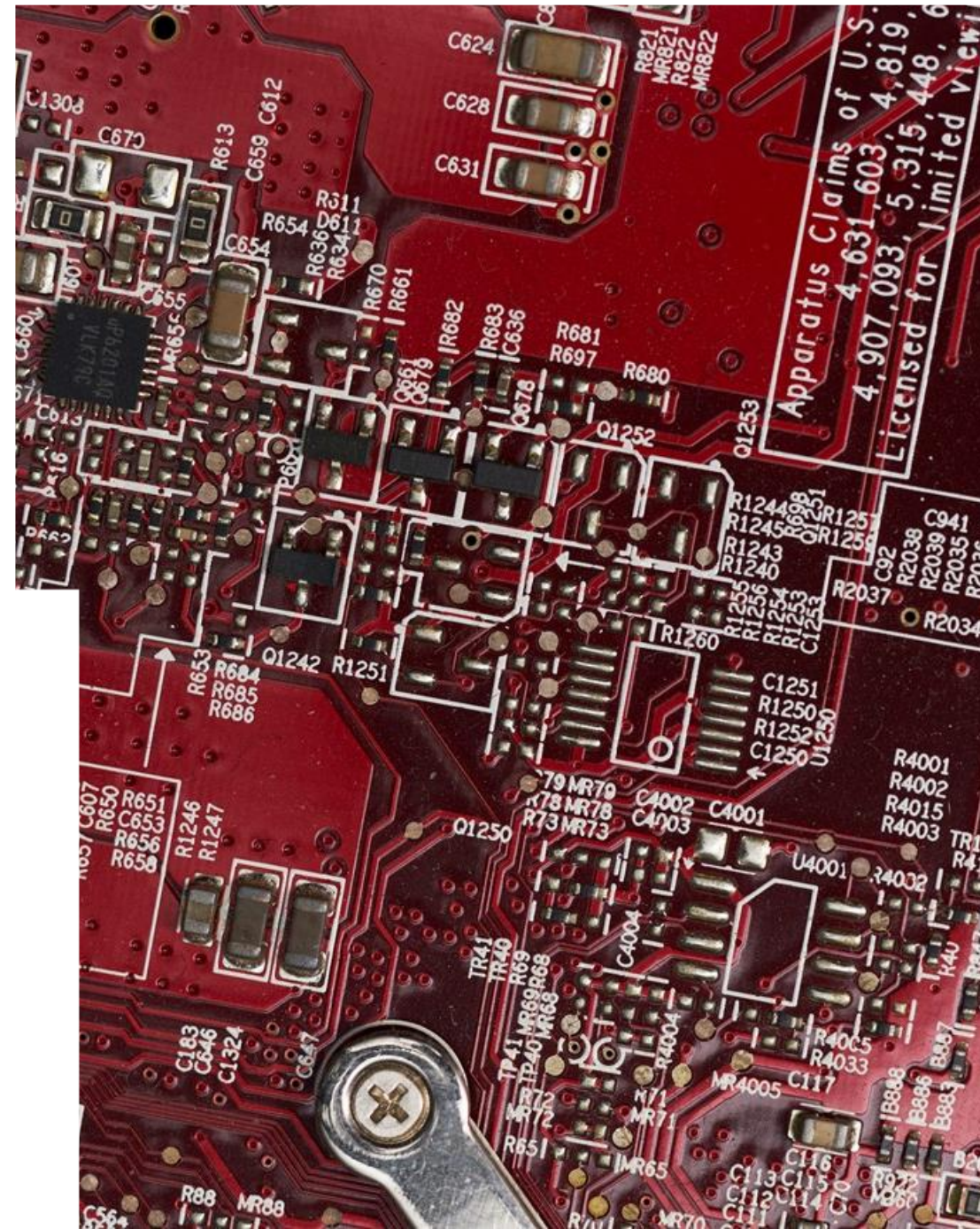


ICT Strategic Update

Opportunities Overview

2022/23 Plan: Potential Future Activities

- Renewal of two National Research Facilities
 - i. UK National Ion Beam Centre
 - ii. National Epitaxy Facility
- New Horizons
- CHIST-ERA call
- Various calls focussing on HCI, sustainability (subject to SR outcome)





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EPSRC Digital Portfolio Changes

Dr Sonia Raikova – Portfolio Manager (PUC)

EPSRC Digital Technology Portfolio

Changes which took effect as of 1 April 2022

EPSRC operate challenge themes to address and deliver impact against the most pressing challenges of the moment. We continually review these challenges, and the strategic outcomes we seek. We have reflected on our theme landscape, the external landscape, priorities and policy drivers.

We have now closed **Digital Economy** and **Digital Twins** as separate themes, whilst mainstreaming the Digital Economy approach, embedding appropriate user involvement, interdisciplinary working and true co-creation with potential users of research in all our digitally-facing research.

A new theme came into operation in April 2022 to coincide with the new financial year – '**Digital Security & Resilience**' (DS&R).

Key points:

- Interdisciplinary, sociotechnical, user-focused research will continue to be supported by EPSRC
- Projects previously supported via Digital Economy Theme will now be funded via ICT or DS&R
- Projects must still be at least 50% within EPSRC remit to qualify for funding

Digital Security & Resilience

A new EPSRC theme entitled 'Digital Security & Resilience' (DS&R) will put a spotlight on digital technologies relevant to the security, defence, and resilience of the UK. The research supported would aim **to create a more secure and resilient digital society, that is robust and prepared to withstand shocks and challenges in an increasingly interconnected digital world.**

We will do this by:

- Developing EPSRC's strategy for digital security and resilience, and for specific topic areas falling under that remit, such as cyber security and digital twinning.
- Building communities, networks, and capacity to deliver national capability in specific digital security and resilience topic areas.

Broadly, the Digital Security & Resilience theme's investments will fall in two areas:

1. Research to promote and improve the security and resilience of digital technologies.
2. Research into digital technologies that would be developed to promote and improve the security, defence, and resilience of the UK, and the security and resilience of its organisations, systems, infrastructure, and society.



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Responsible Innovation and Ethics

Dr Deepali Lodhia- Portfolio Manager (Impact)

Responsible Innovation

EPSRC is committed to ensuring that our activities and the research we fund is aligned with the principles of **Responsible Innovation**

It is our ambition that responsible innovation is **business-as-usual** for researchers. This will be the case when researchers:

Take time to seriously consider with stakeholders both the positive and negative effects their work could have on the world we live in.



Actively adjust their research plans, where appropriate, to maximise positive and minimise negative impacts.

Responsible Innovation

RI is...

- Taking steps to maximise the positive and minimise the negative impact of research
- Actively de-risking impact across the full lifecycle of research
- A collective responsibility where funders, researchers and the public, have an important role to play
- Considers elements of ethics, public engagement, risk and regulation

RI isn't...

- A prescriptive doctrine with a step-by-step process
- Trying to predict the future
- Able to avoid all problems arising from research and innovation
- Able to relieve researchers and funders from taking responsibility
- The same as ethics, public engagement, risk and regulation - but it does consider elements common to all of these

Responsible Innovation

Why is it important?

What would have happened if Thomas had applied RI to his research?

He discovered a way of preventing “knocking” in internal combustion engines...

...by adding lead to petrol

(he also helped discover and pioneer the use of a new set of non-toxic refrigerants and aerosol propellants – CFCs – but RI unlikely to have helped in this case!)



Thomas Midgley
(1889 – 1944)

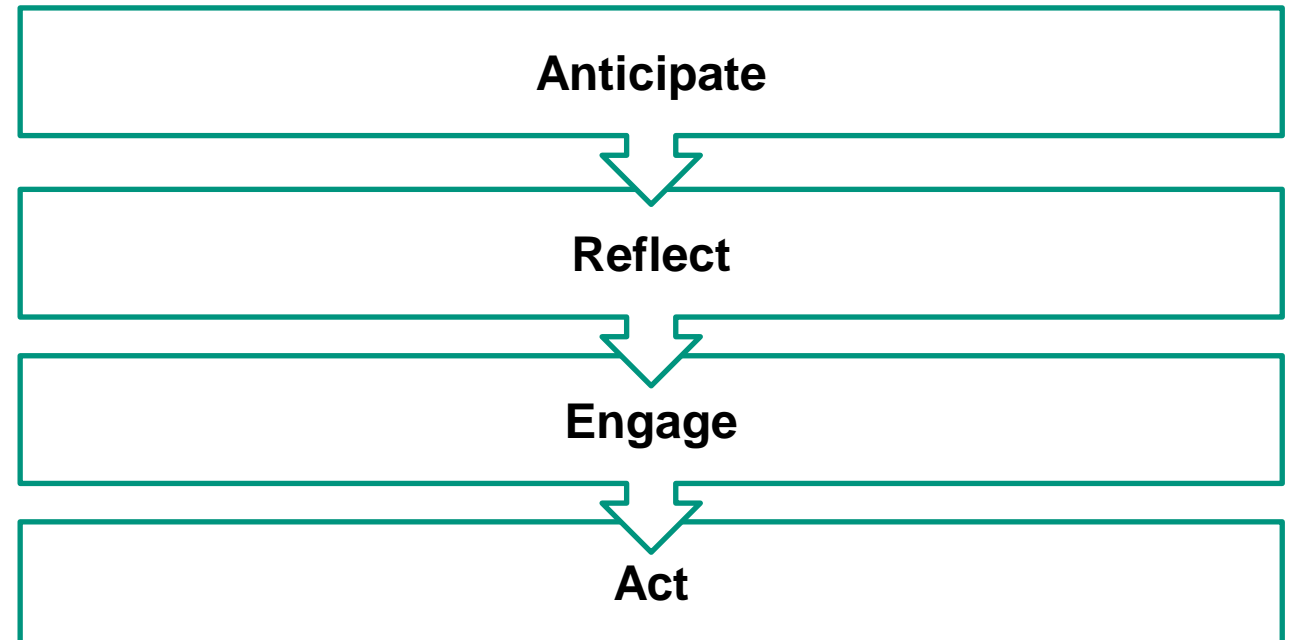
“possessed an instinct for the regrettable that was almost uncanny” – Bill Bryson

Responsible Innovation

EPSRC is committed to ensuring that our activities and the research we fund is aligned with the principles of **Responsible Innovation**

<https://epsrc.ukri.org/research/framework/area/>

AREA Framework is an approach to considering responsible innovation:



Responsible Innovation

What are our long-term ambitions?

- For responsible innovation to be business-as-usual for researchers.
- Increased recognition of the opportunity responsible innovation offers in exploring and opening up new, more sustainable, more socially desirable pathways for innovation.

Whilst EPSRC's RI approach and AREA framework are well established, we acknowledge that there is still more that needs to be done in this space.

What is required?

- Need to '*bring RI to life*' across all EPSRC disciplines
- **Effective delivery** of desired culture change will not happen without appropriate resources/ leadership and commitment.
- Need to **work in partnership** to deliver this culture change.



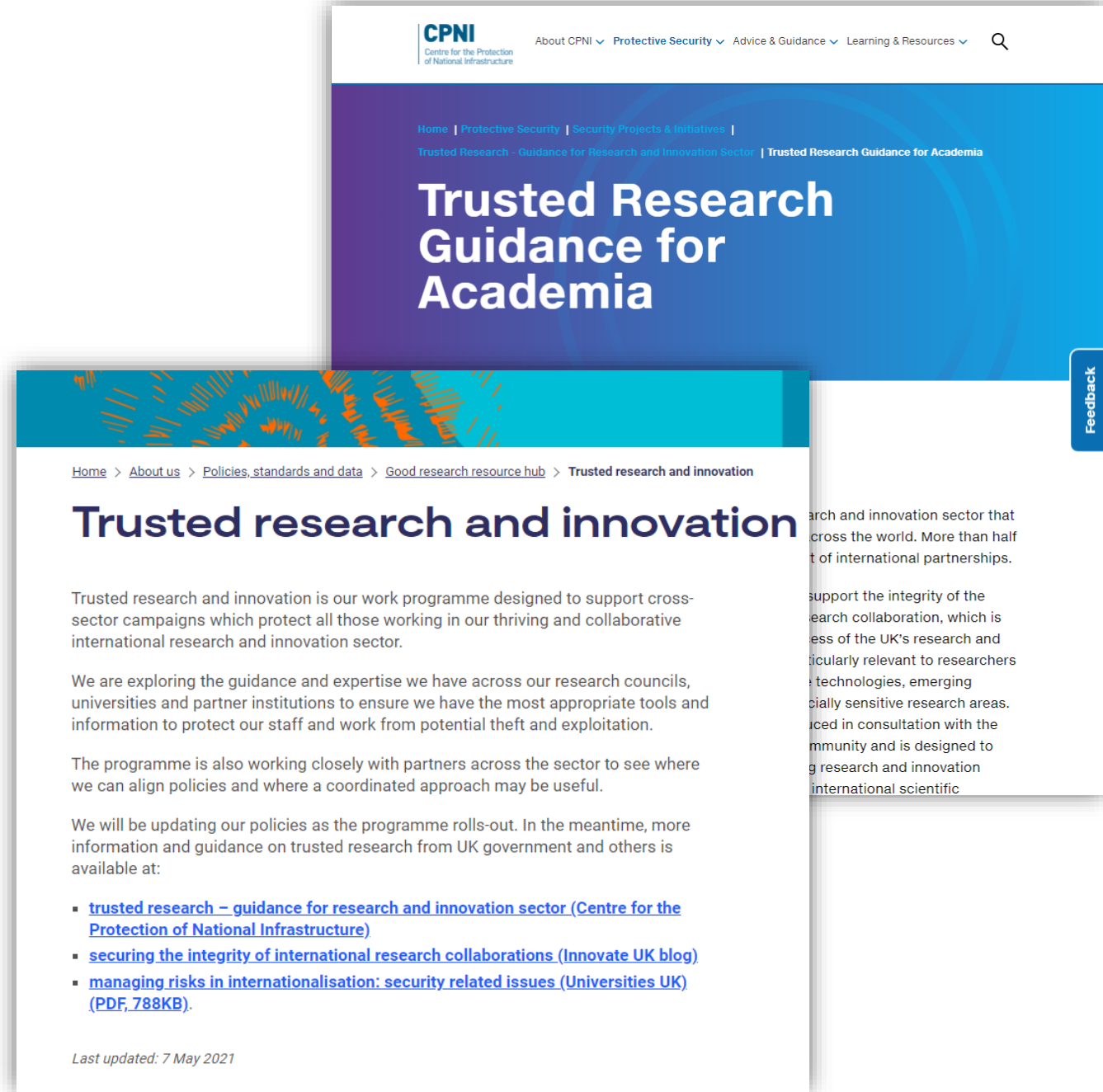
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Trusted Research

Dr Alex Oliver- Portfolio Manager (Electronics)

Trusted Research

- How to manage risks associated with international collaboration on emerging technologies – particularly where there is dual civil-military use potential.
- Trusted Research framework:
 - Outlines the potential risks to UK research and innovation
 - Helps researchers, UK universities and industry partners to have confidence in international collaboration and make informed decisions around those potential risks
 - Explains how to protect research and staff from potential theft, misuse or exploitation



The screenshot shows the CPNI website page for 'Trusted Research Guidance for Academia'. The page features a blue header with the CPNI logo and navigation links. The main content area has a blue background with the title 'Trusted Research Guidance for Academia' in white. Below the title, there is a breadcrumb trail: 'Home > About us > Policies, standards and data > Good research resource hub > Trusted research and innovation'. The main heading is 'Trusted research and innovation'. The text describes the programme's purpose: 'Trusted research and innovation is our work programme designed to support cross-sector campaigns which protect all those working in our thriving and collaborative international research and innovation sector.' It also mentions that the programme is exploring guidance and expertise across research councils, universities, and partner institutions to ensure appropriate tools and information to protect staff and work from potential theft and exploitation. The programme is working closely with partners across the sector to align policies and coordinate approaches. The page lists three key resources: 'trusted research – guidance for research and innovation sector (Centre for the Protection of National Infrastructure)', 'securing the integrity of international research collaborations (Innovate UK blog)', and 'managing risks in internationalisation: security related issues (Universities UK) (PDF, 788KB)'. The page is last updated on 7 May 2021.

Trusted Research- Operational protocols

- Criteria for identification of risk
 - i. Whether the research in and of itself poses a risk as a potential dual use technology.
 - ii. Whether there was potential for an involved actor to develop the research into potentially detrimental technologies, outputs, or agenda.
 - iii. Whether the research fell within an area which represented a sovereign capability, was an area of known concern for potential for misuse or could contain sensitive information which would be of benefit to remain in the UK (e.g. proprietary technology).



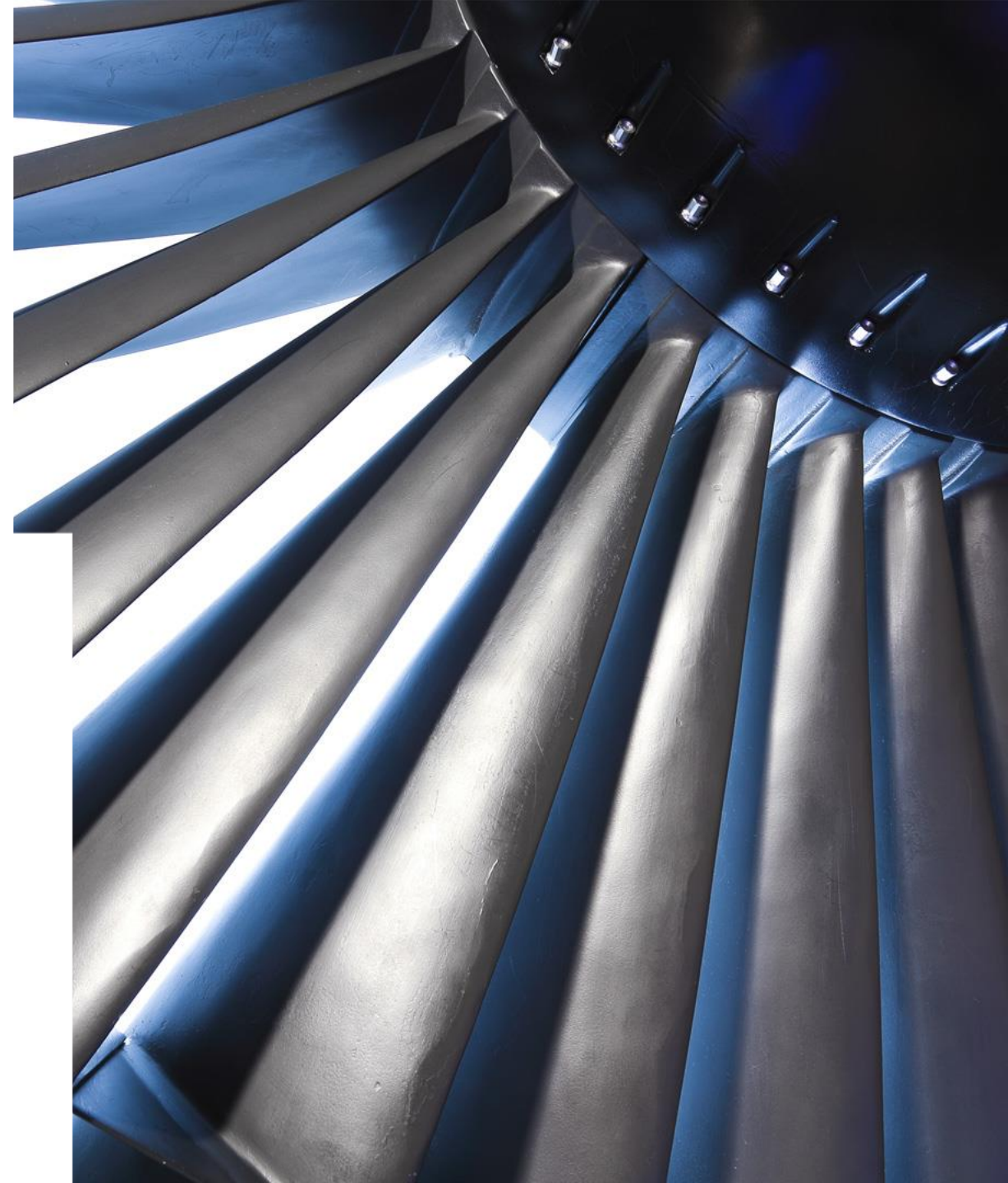
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ICT International Strategy

Joanne Humphries- Portfolio Manager (HCI)

International Overview

- Currently developing our strategy for encouraging international collaboration across ICT
- Cross EPSRC lead agency agreements
- CHIST-ERA program with EU
- Across grant schemes:
 - Costs for UK elements of collaboration
 - Visiting researchers
- Overseas Travel Grants (for eligible UK applicants)
- Workshop grants
 - UK bilateral workshops (funding to cover travel and accommodation expenses of UK participants and, for UK meetings, core meeting costs)



ICT International Strategy

Overarching Aims

- World-leading partnerships between global researchers
- A focus on identified areas of importance, core capability or challenge areas
- The strategic exchange of people, skills and capabilities to fill in gaps in UK research excellence and solve internationally relevant problems
- Promote UK research on a world scale

Goals

- Ensure UK stays internationally connected in order to stimulate world leading research
- Provide UK researchers with opportunities to gain access to tools, systems, testbeds that otherwise would be unavailable or difficult to create in the UK and provide international researchers with opportunities to access UK capability
- Provide opportunities for UK to influence policies and technical standards with international partners and address global challenges

CHIST-ERA



- CHIST-ERA is an ERA-NET programme, involving 28 research organisations from Europe and beyond (Taiwan & Quebec)
- The aim is to fund fundamental ICT research, where collaboration between 3+ research groups from different countries will progress this research
- Annually, two topics are chosen & EPSRC supports one of these topics with £1 million of funding
- For 2022, the ICT theme will be supporting the Security and Privacy in Decentralised and Distributed Systems (SPiDDS) Topic. The Call will open Summer & close Dec 2022 .
- CHIST-ERA are in the process of announcing their first Open Science Call which is expected to launch in Summer 2022



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Questions?



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Thank you



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