

EPSRC Quantum Technologies Theme Presentation

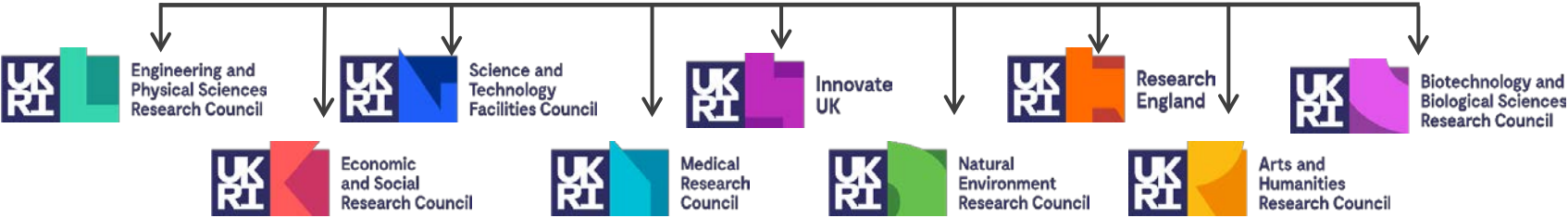
Joseph Westwood – Senior Portfolio Manager
31st May 2022



UK NATIONAL
QUANTUM
TECHNOLOGIES
PROGRAMME

Summary

- To provide the context for EPSRC's investments in Quantum Technologies as part of the UK National Quantum Technologies Programme
- To share current EPSRC plans on Quantum Technologies
- To highlight international collaboration



EPSRC Vision

- To make the UK recognised as the place where the most creative researchers can deliver **world-leading engineering and physical sciences research**
- To work within the research ecosystem of UKRI, the R&D base within business, SMEs, government departments, charitable organisations and international **partnerships** to identify and tackle new research challenges and deliver societal and economic impact from our research base
- To build on our **strong working partnerships with business** to play a leading role within UKRI, particularly working in **partnership with IUK**, in delivering economic prosperity to the UK (and hence the government's target of 2.4% of GDP invested in R&D by 2027)

Research and Innovation Landscape 2022

- HMG Integrated Review 2021
- R&D People and Culture Strategy
 - Including launch of “New Deal for Postgraduate Researchers”
- UK Government: Innovation Strategy
- The Review of Research Bureaucracy (BEIS)
- Levelling Up White Paper
- UK National AI Strategy
- Build Back Better: Our plan for Growth (2021)
- National Security and Investment Act (2021)
- Comprehensive Spending Review (Autumn 2021)
- UKRI Strategy (Autumn 2021)
- EPSRC Delivery Plan (Spring 2022)
- UK Government Quantum Strategy - ongoing



Update on Spending Review 2021

- The Government Spending Review announced on Oct 27th specifically increases the Core Research budget used by UKRI research councils and Research England, and the National Academies.
- UKRI's allocation from BEIS is £25bn for 22/23 to 24/25.
- This increased and sustained investment through a 3 year settlement for research and innovation is certainly welcome.
- Internal allocation of budgets to different councils is currently under way.
- We expect theme budgets to be confirmed by July 2022.

Update on Spending Review 2021

- What does that mean for UK academics?
 - QT budget set for the coming years and some activities under our priorities will be possible
 - An uplift would allow for bigger and additional investments as spend budget is limited each year through large investments like the Hubs.
 - We will be able to start activities up to the end of Phase 2 of NQTP, but funding beyond FY24/25 will not be covered in the announcement.
 - We have started to look at possible scenarios of what activities we would like to see in Phase 3 and will start to seek community input this year to help plans take shape.

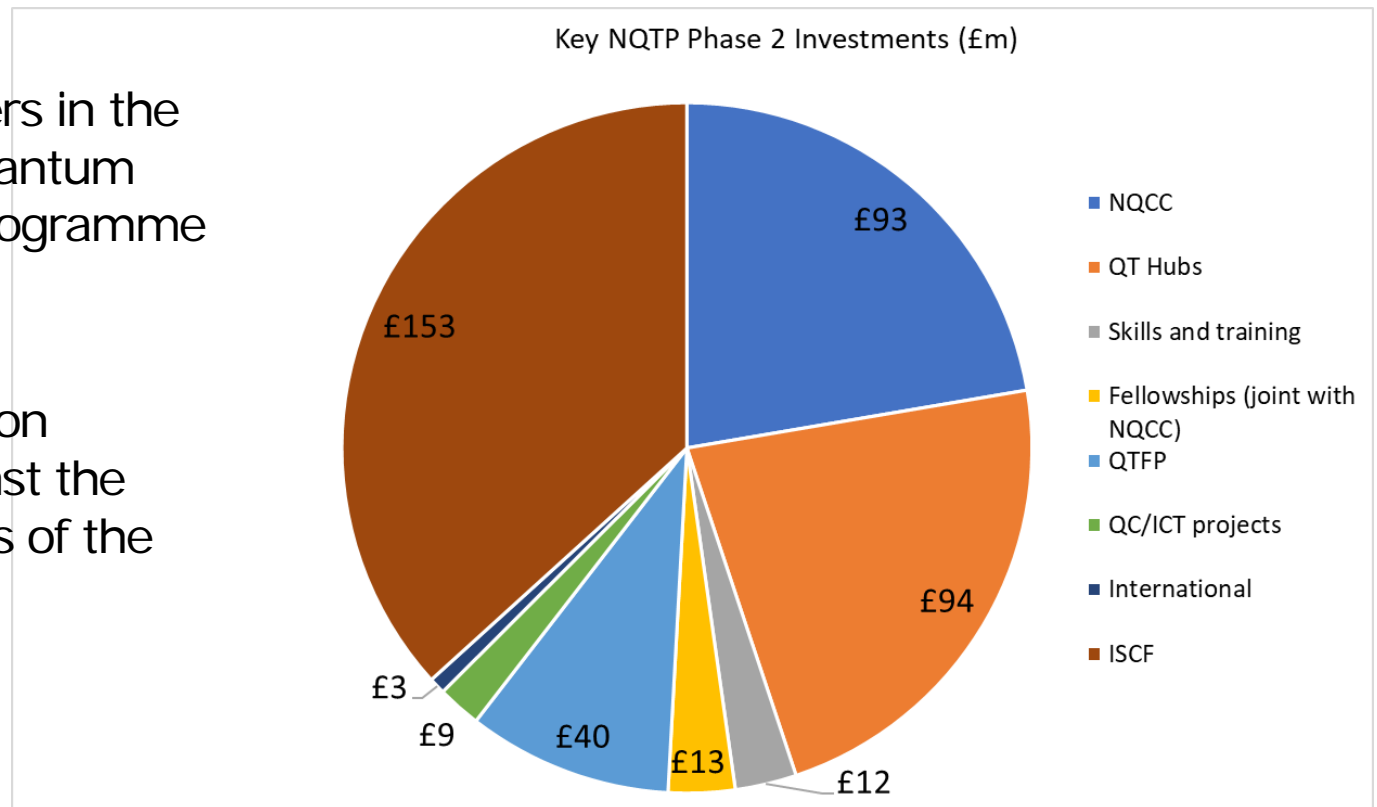
National Quantum Technologies Programme



- The UK National Quantum Technologies Programme (NQTP) is a £1 billion dynamic collaboration between industry, academia and government.
- It supports ideas, innovation and investment to secure UK advantage and opportunities in the globally competitive new quantum era.
- Phase 1: 2014-2019 - Widening awareness, understanding and take-up of quantum technologies in government, industry and academia
- Phase 2: 2019-2024 - Increase the focus of commercialisation and innovation around Quantum Technologies

Where does EPSRC fit within the NQTP?

- One of 8 partners in the UK National Quantum Technologies Programme in Phase 2
- Activities focus on delivering against the NQTP objectives of the Strategic Intent



National Quantum Computing Centre

NQCC launched September 2020

- Investment of £93m by UKRI over 5 years through EPSRC and STFC, as part of the National Programme
- Facility located at Harwell Campus – completion 2023
- Aim to work with government, industry and the research community to enable the delivery of quantum computing capabilities for the UK
- Focus on the challenge of scaling QC, and supporting growth of the wider UK ecosystem



EPSRC Quantum Technologies Priority Themes

Emerging quantum technology areas

- Delivering the next generation of quantum technologies to secure a pipeline of emerging areas
- Delivered through standard mode, strategic calls

Quantum for science users

- Driving science through quantum technologies by working in partnership across research councils => NERC collaboration in progress
- Delivered through strategic calls, QTFP

Exploiting the Quantum Computing advantage

- Support for a breadth of QC research and skills programmes to complement the NQCC priorities CC
- Delivered through strategic calls e.g ICT/QC call, collaboration on quantum readiness programme

Engineering quantum technology systems

- Overcoming engineering challenges such as reducing size, weight, power and cost of devices to meet user needs => workshop 10th May
- Future funding opportunities planned

EPSRC Quantum Technologies Priorities

Priority activities for 22/23 ranging from **investment**, **engagement** and **future planning**

- **Support the 4 QT Hubs** as part of Phase 2: maintaining the technological research leadership that the UK has established in QT
- **NQCC (delivered by EPSRC/STFC)**: Delivering this critical UK national centre to build UK capability and leadership in Quantum Computing
- **International collaboration**: to continue to accelerate research progress and knowledge sharing in new emerging areas across TRLs
- **Materials for Quantum**: new network funded, community events coming soon

EPSRC Quantum Technologies Priorities

Priority activities for 22/23 ranging from **investment**, **engagement** for strategy development and **future planning**

- **Materials for Quantum**: new network funded, community events coming soon
- **Activities beyond Phase 2**: What funding mechanisms are most suitable for support of research excellence when the Phase 2 Hubs come to an end?
- **Training and skills**: focus on studentships (different routes and exploring possible priority areas)
- **International collaboration**: Exploring new collaborative routes

EPSRC Quantum Technologies Priorities

Priority activities for 22/23 ranging from investment, engagement and **future planning**

- **Activities beyond Phase 2:** What funding mechanisms are most suitable for support of research excellence when the Phase 2 Hubs come to an end?
- **Infrastructure:** Analyse appropriate actions following the SAB infrastructure report due May/June 22
- **EPSRC Strategic Delivery Plan:** Where can QT add value to or lead activities across EPSRC?
- **UK Government Quantum Strategy:** What role can EPSRC play in delivering the recommendations?

How can you support EPSRC's work?

- Share your priorities – where are synergies?
- What are the emerging areas within QT?
- What are barriers/areas of concern in the community?
- What opportunities are you keen to engage in?
- Are you already part of EPSRC's peer review college?

<https://epsrc.ukri.org/funding/assessmentprocess/college/memberselection/>

EPSRC's International Strategy

- Research is an international endeavour and many of the challenges that we face are global. Our strategy for international engagement is to maintain the UK's position for high-quality research and training, and to provide opportunities for researchers to collaborate internationally.
- We want to ensure that the best UK research organisations are working with the best research organisations from the rest of the world. We work with key partners in the UK and abroad to help researchers and research organisations to get maximum value from international collaborations and opportunities.

International funding opportunities through UKRI

- [Lead agency agreements](#): [apply](#) through EPSRC Standard Mode for joint funding of projects with
 - USA (NSF) – please note the current scope does not include Quantum Technologies
 - Brazil
 - Ireland
 - Luxembourg
- [Overseas Travel Grant](#)
- Visiting researcher: include a visit from an internationally-based expert as part of any standard mode proposal
- [EPSRC Network Grant](#): build interdisciplinary research community – in the UK, international element optional

Horizon Europe

- Details on the Government confirmation on funding for successful UK applicants and guidance for applicants can be found on the UKRI website:

[Horizon Europe: help for UK applicants – UKRI](#)

[Horizon Europe guarantee notice and guidance – UKRI](#)



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EPSRC Lead Agency Agreements



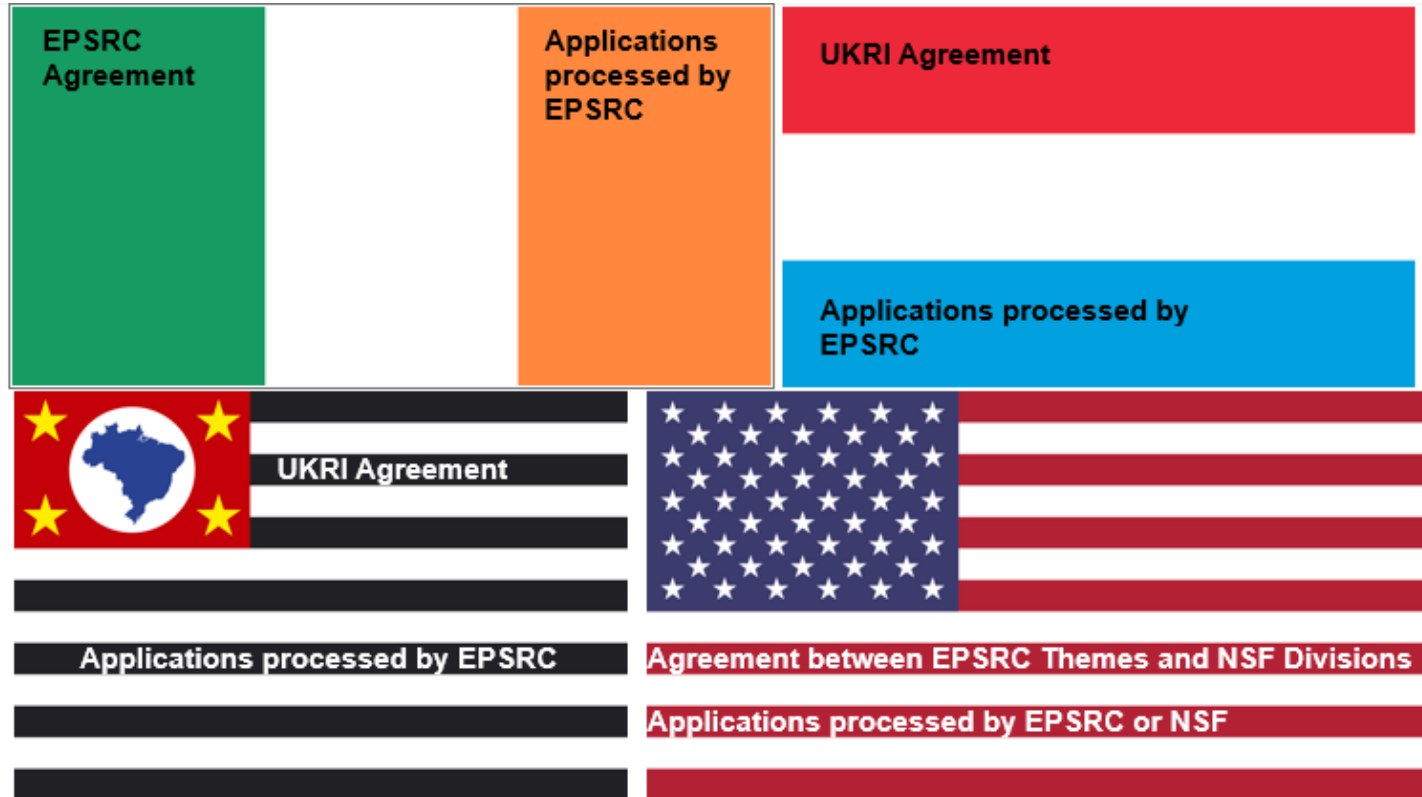
What is a Lead Agency Agreement?

- Lead Agency Agreements provide a framework for joint peer review of proposals by two funding agencies in different countries.
- One organisation takes the lead in managing the review process with an agreed level of participation by the other, and both agencies access the outcome of the review process and fund the costs of the successful applications in their respective countries.
- To reduce barriers to working internationally

EPSRC Agreements

- **Ireland** – Science Foundation Ireland (SFI)
- **Luxembourg** – National Research Fund (FNR) *Fonds National de la Recherche*
- **Sao Paulo, Brazil** – Sao Paulo Research Fund (FAPESP) *Fundação de Amparo à Pesquisa do Estado de São Paulo*
- **USA** – National Science Foundation (NSF)*

*Between Engineering, ICT and Manufacturing the Future Themes and three divisions of the NSF Directorate of Engineering (ENG) Division of Chemical, Bioengineering, Environmental and Transport Systems (CBET), Division of Civil, Mechanical and Manufacturing Innovation (CMMI) and the Division of Electrical, Communications and Cyber Systems (ECCS) and between Mathematical Sciences Theme and the NSF Directorate for Mathematical and Physical Sciences (MPS), Division of Mathematical Sciences (DMS).





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NSF Lead Agency Agreement



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General Information

- Applications are processed according to the lead partners normal procedures and in accordance with the lead agency's review criteria.
- Standard mode only
- Proposals are expected to adhere to typical proposal sizes and durations.
- NSF can nominate experts to be involved in the EPSRC peer review process on a case-by-case basis.
- Funding by EPSRC and NSF is decided by the appropriate EPSRC Theme Lead in consultation with NSF following the recommendation of the EPSRC panel.

SFI/FNR/FAPESP Lead Agency Agreements – Similarities

- EPSRC will fund UK researchers and Partner Agency will fund international researchers
- Applications should follow standard format and will be processed according to EPSRC's standard peer review procedures

Prior to submission

- Submit an Expression of Interest (EoI) a minimum of three months/60 days (USA) before planned full proposal submission
- EoI form is on the website
- EPSRC and Partner Agency will assessed remit and eligibility.

SFI/FNR/FAPESP Lead Agency Agreements – Similarities

Full proposal submission

- Title should include partner agency code e.g. EPSRC-SFI, CBET-EPSRC
- International collaborating research organisation should be added as Project Partner, with funding request from Partner Agency as the Project Partner contribution figure
- International research information should be included in Track record and scientific case for the international components of the project in your Case for Support.
- JoR include justification of international researcher's costs

SFI/FNR/FAPESP Lead Agency Agreement – Differences



- SFI documents required – included as ‘Other Attachment’
- maximum cost of €500,000 for direct costs – additional contribution to overhead costs will also be made by SFI



- FNR – INTER Budget form and INTER Budget Details form – included as ‘Other Attachment’
- Nominated experts may be involved in the peer review process



- Sao Paulo research should make submission through SAGE
- Nominated experts may be involved in the peer review process

What's Next/Contacts

- Updating the agreement – simplifying and broadening
- International Team – International@epsrc.ukri.org
- International Senior Manager – Clare Williamson
Clare.Williamson@epsrc.ukri.org
- NSF Lead Agency Agreement Contacts
 - Engineering – Naomi South
 - Mathematics – Victoria Lund
 - Manufacturing the Future – Stephanie Williams
 - ICT – Jo Humphries



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Thank you



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Quantum Technologies Theme Contacts

Team member	Responsibilities (as of April 2022)	Contact email
Anke Davis	Joint Head of Quantum Technologies Theme- Budget holder International strategy lead, new areas of QT	Anke.Davis@epsrc.ukri.org
<i>Katharine Dunn – maternity leave from May-Dec 22</i>	<i>Joint Head of Quantum Technologies Theme- Budget holder Training & Skills strategy lead, NQCC contact</i>	<i>Katharine.Dunn@epsrc.ukri.org</i>
Helen Hunt	Senior Portfolio Manager; Oversight of QT Hubs; Trusted Research lead, Monitoring & Evaluation; Quantum imaging	Helen.Hunt@epsrc.ukri.org
Joseph Westwood	Senior Portfolio Manager; International activity delivery; Secretariat for UKNQTP Programme Board and UKNQTP Strategic Advisory Board	Joseph.Westwood@epsrc.ukri.org
Amanda Howes	Portfolio Manager; Quantum computing and simulation; Quantum communications	Amanda.Howes@epsrc.ukri.org
Dawn Chan (as of April 22)	Portfolio Manager; Quantum communications; Fellowships	Jiarong.Chan@epsrc.ukri.org
Adam Oliver	Portfolio Manager; Quantum sensing and timing; Quantum components; Infrastructure	Adam.Oliver@epsrc.ukri.org
New starter (July 22)	Portfolio Manager; Quantum computing and simulation; NQCC contact; Studentships	tbc
Charlotte Hiett	Delivery support	Charlotte.Hiett@epsrc.ukri.org