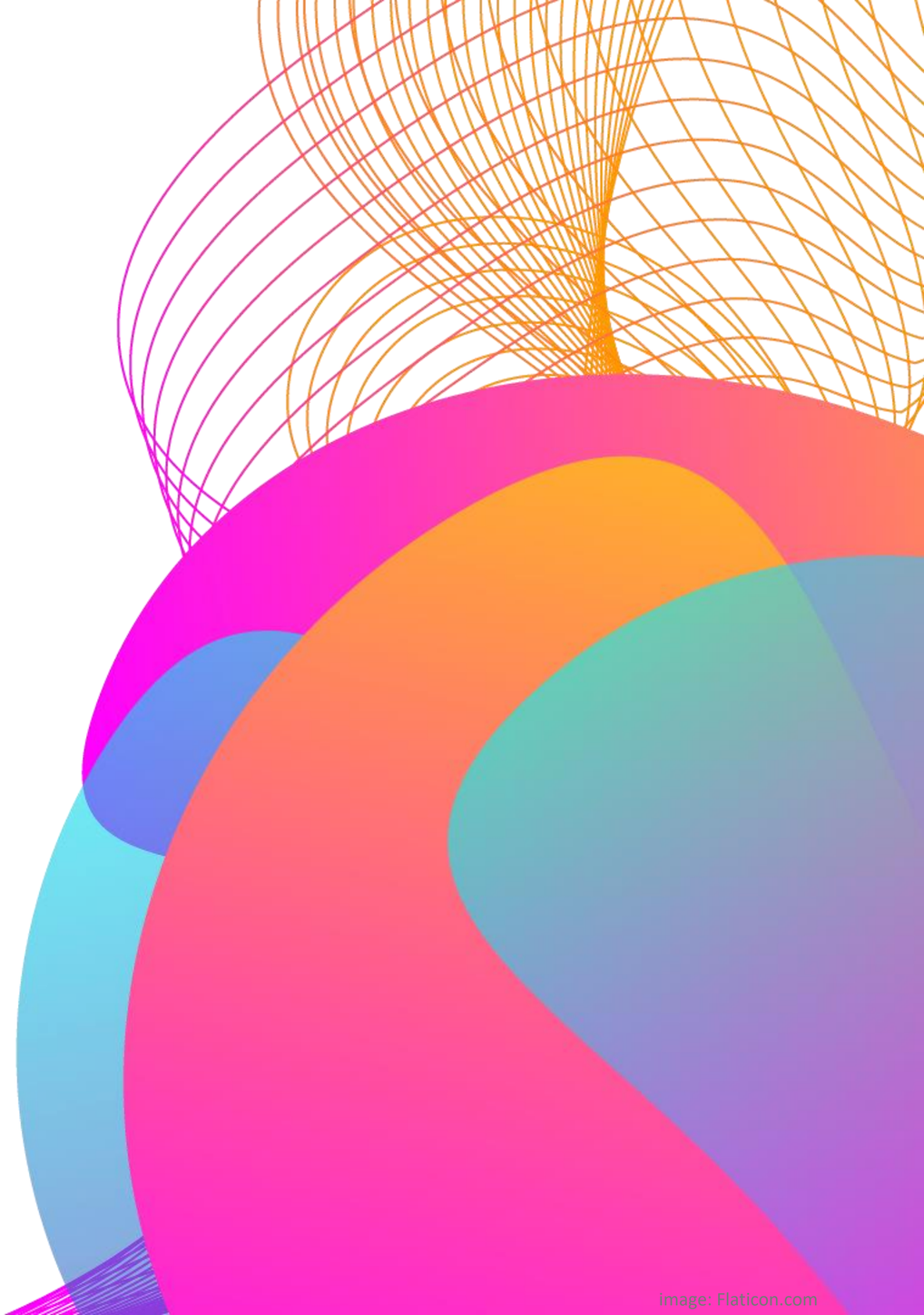
Department for
Science, Innovation
& Technology

The UK’s quantum roadmap
Office for Quantum



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AGENDA

- Introduction
- The programme so far
- National strategy & missions
- Looking ahead

***Rachel Maze** is the Deputy Head of the Office for Quantum within the UK Department for Science & Technology*

The story so far: over £1bn National Programme

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Research

- **Centres of excellence:** building regional strengths through the hubs network
- **Unlocking new applications:** targeted research programmes

Innovation

- **Accelerating commercialisation:** Challenge programme involving 180+ UK companies
- **Driving public sector solutions:** through the Catalyst Fund

Infrastructure

- **National Quantum Computing Centre** to accelerate scaling and readiness
- **Testing and assurance** through the National Physical Laboratory

Skills

- **Developing, attracting and retaining talent:** through PhDs, fellowships and apprenticeships

UKRI Engineering and Physical Sciences Research Council
UKRI Innovate UK
UKRI Science and Technology Facilities Council
UKRI National Quantum Computing Centre
NPL
Ministry of Defence
dstl
GCHQ

The result: a world-leading ecosystem…

World leading research and skills: 1st in Europe and 3rd in the world for the quality and impact of quantum research.

Thriving business community: 2nd for the number of quantum companies (11% of the world's quantum companies)

High-levels of private investment: 2nd in attracting private equity investment (12% of global private investment)

Broad capabilities: Quantum companies spanning computing, communications, sensing, timing, imaging, and the supply chain

...with real-world applications

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Reducing industrial emissions

QLM are using lidar to autonomously detect and measure methane emissions.

Resilient flight navigation

Infleqtion completed test flights with quantum-based navigation offering accuracy and resilience to satellite disruption.

Transforming brain scanning

Cerca’s wearable brain scanner trialled in hospitals and is deepening our understanding of brain developments

UK National Quantum Strategy (2023)

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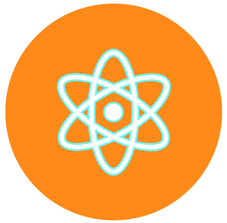
A ten-year plan building on the foundations laid by the National Quantum Technologies Programme since 2014, with four key pillars:



Ensure the UK is home to **world-leading quantum science** and engineering

Make the UK the go-to place for quantum **businesses.**

Drive the use of quantum technologies in the UK to **benefit the economy, society and security**

Create a national and international regulatory framework that **supports innovation and the ethical use** of quantum

UK Quantum Missions

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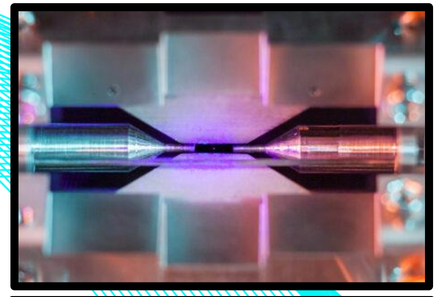
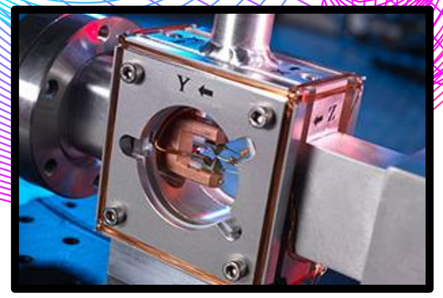


Mission 1: By 2035, there will be accessible, **UK-based quantum computers** capable of running 1 trillion operations and supporting applications that provide benefits well in excess of classical supercomputers across key sectors of the economy.



Mission 4: By 2030**, quantum navigation systems**, including clocks, will be deployed on aircraft, providing next-generation accuracy for resilience that is independent of satellite signals.

Mission 2: By 2035, the UK will have deployed the world's most advanced **quantum network** at scale, pioneering the future quantum internet.

Mission 5: By 2030, mobile, **networked quantum sensors** will have unlocked new situational awareness capabilities, exploited across critical infrastructure in the transport, telecoms, energy, and defence sectors.

Mission 3: By 2030, every NHS Trust will benefit **from quantum sensing-enabled solutions**, helping those with chronic illness live healthier, longer lives through early diagnosis and treatment.

Supporting the National Missions:
Opportunities from quantum

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Make Britain a clean energy superpower

- ❑ Battery material simulation
- ❑ Grid optimisation to improve resource efficiency
- ❑ Emissions monitoring

Kickstart economic growth

- ❑ Quantum computing a $1-$2tn global opportunity
- ❑ Massive cross-sector productivity opportunity
- ❑ Earlier benefits from sensors and hybrid solutions

Build an NHS fit for the future

- ❑ Improved diagnosis and detection with sensing
- ❑ Simulation for novel drug discovery
- ❑ Reduce device costs and improve accessibility with new biomedical imaging

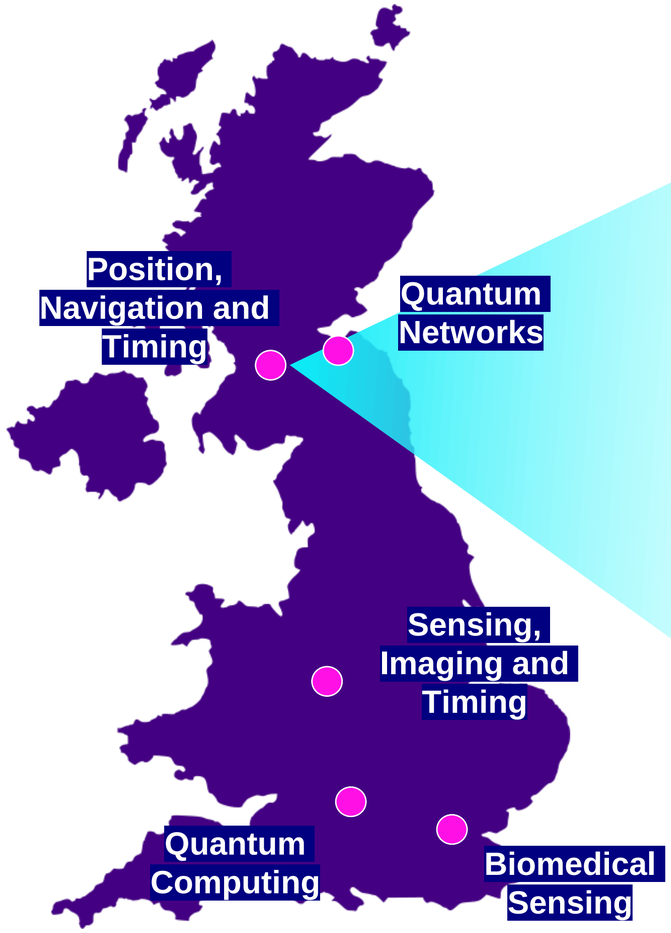
Take back our streets

- ❑ Un-jammable quantum navigation to protect commuters, military personnel and logistics
- ❑ Detecting out of sight objects, including concealed weapons

Break down barriers to opportunity

- ❑ Broaden talent pool through apprenticeships and other routes
- ❑ Inspire future STEM students

Continued commitment: £100m for new hubs

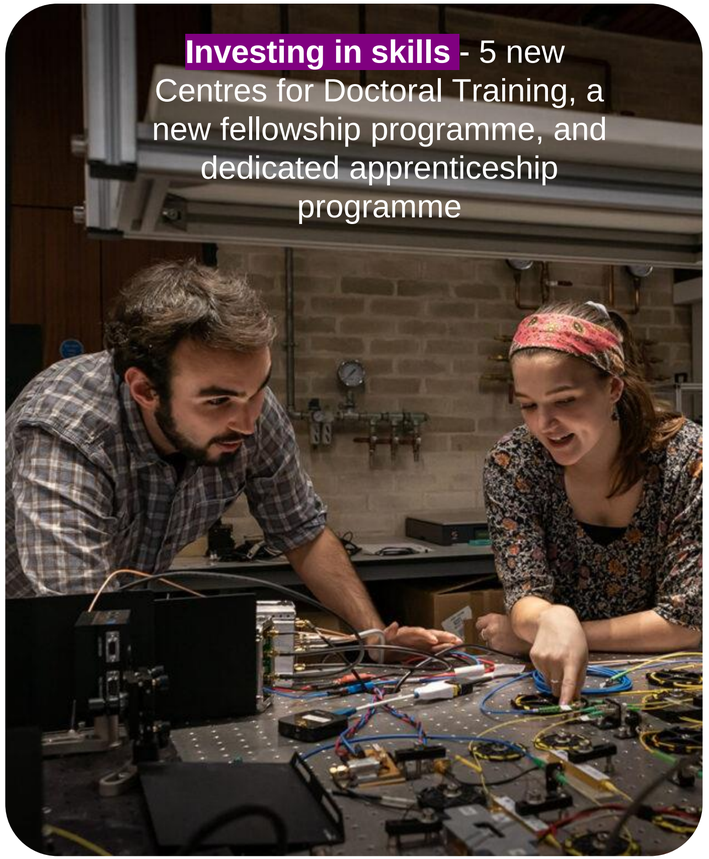


Science Secretary on quantum:

"*We are at the foothills of where quantum technology is going to take us and that provides a huge opportunity for British science and British research and development*."

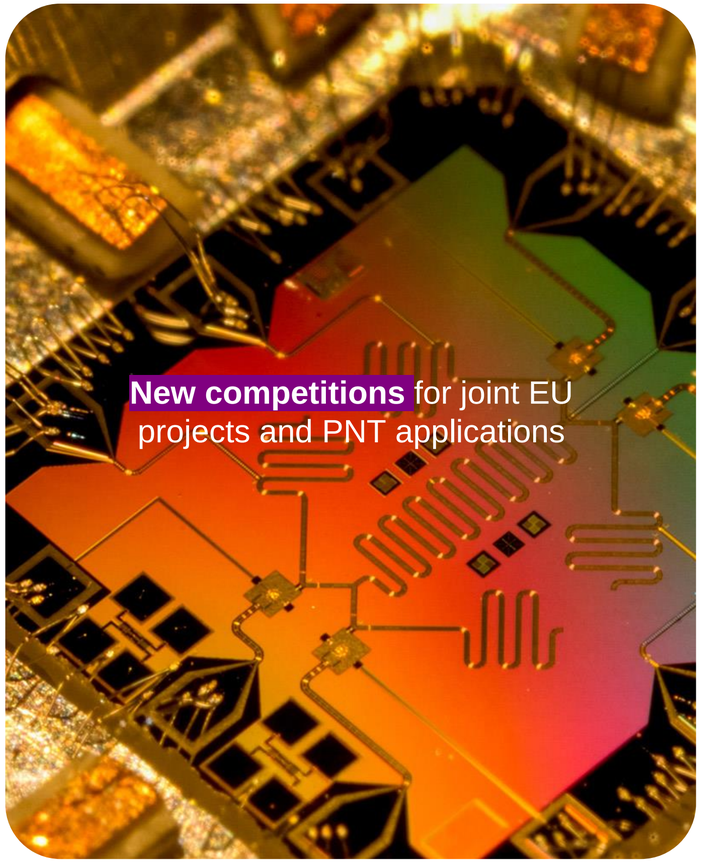
Progress in 2024: continued delivery

Train



Investing in skills - 5 new Centres for Doctoral Training, a new fellowship programme, and dedicated apprenticeship programme

Commercialise



New competitions for joint EU projects and PNT applications

Deliver

Testbed programme – phase 1 delivery of NQCC's testbeds to accelerate quantum adoption and benchmark modalities

Looking ahead

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Nurturing new talent

Scaling up our infrastructure

Leadership on regs and standards

Targeting our funding

Mission programme development

Government Spending Review

Spring / Summer 2025

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GET IN TOUCH

Contact the UK Office for Quantum at: OfQenquiries@dsit.gov.uk