

National Quantum Strategy

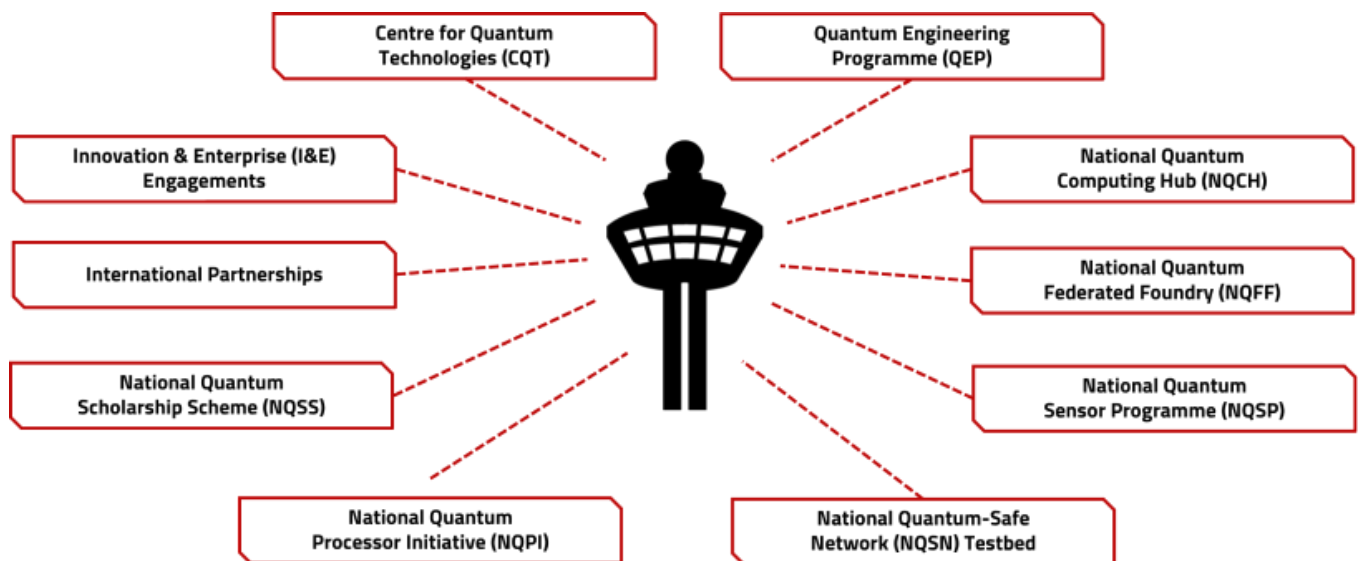
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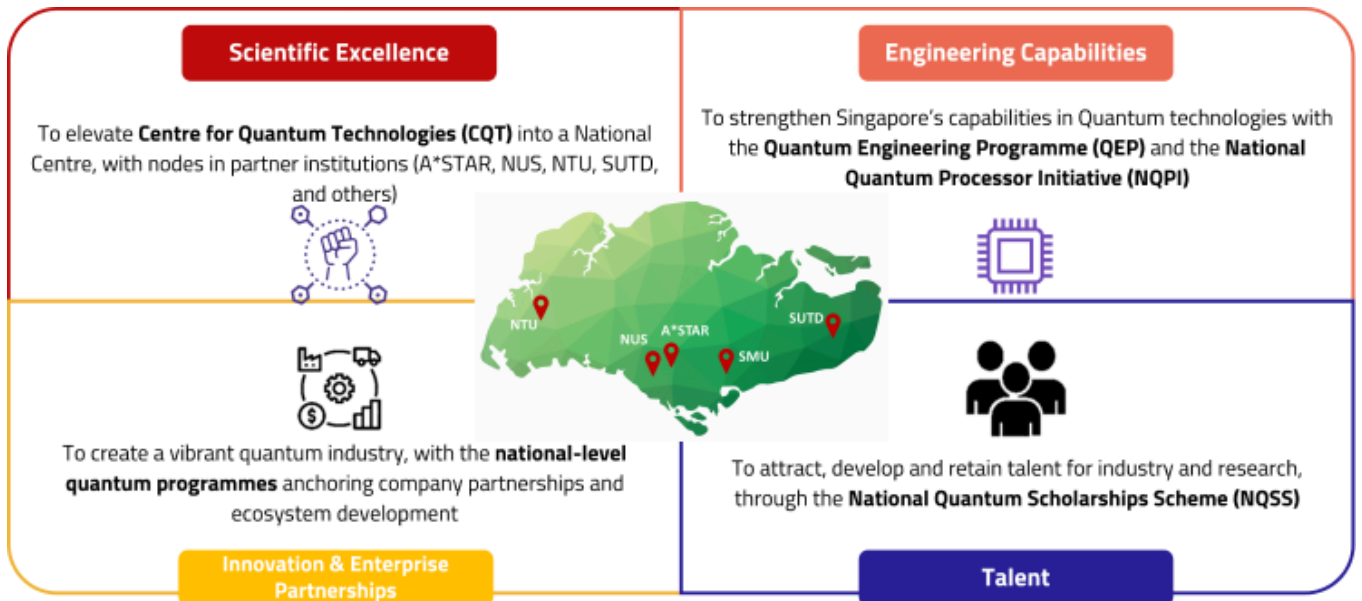
Singapore's National Quantum Strategy

The National Quantum Office (NQO) is a national platform established with the support of the National Research Foundation (NRF) to drive the development and implementation of the National Quantum Strategy in Singapore. Set up in 2022, NQO coordinates quantum Research, Innovation, and Enterprise (RIE) activities in Singapore and is hosted by Agency for Science, Technology and Research (A*STAR). NQO supports fundamental and translational research in Quantum through various strategic programmes, partnering both public and private sectors to create a vibrant Research, Innovation and Enterprise (RIE) quantum ecosystem in Singapore.



Four Strategic Thrusts

Singapore's National Quantum Strategy comprises four strategic thrusts.



[Scientific Excellence](#)

[Engineering Capabilities](#)

[Innovation & Enterprise](#)

[Partnerships](#)

[Attract & Retain Talent](#)

Click on each quadrant to learn more.

Deputy Prime Minister Mr Heng Swee Keat announced the National Quantum Strategy at Asia Tech x Summit on 30 May 2024



[Watch on YouTube](#)

Credit: Infocomm Media Development Authority (IMDA)

Scientific Excellence - National Quantum Office

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National Quantum Strategy's 4 Strategic Thrusts

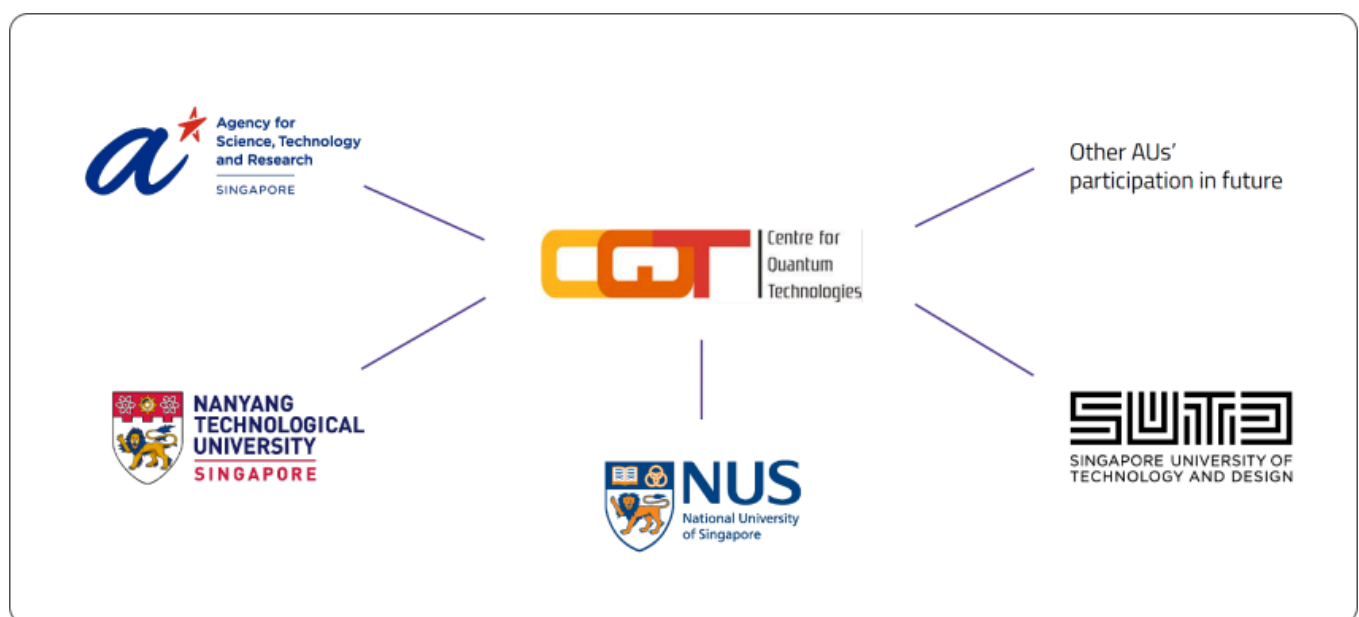
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1. Scientific Excellence



The Centre for Quantum Technologies (CQT) was established in December 2007 as Singapore's first Research Centre of Excellence (RCE) hosted by the National University of Singapore (NUS), and with researchers from the Agency for Science, Technology and Research (A*STAR), Nanyang Technological University (NTU), and the Singapore University of Technology and Design (SUTD). Under the National Quantum Strategy, CQT will be elevated to a national centre with CQT nodes at partner institutions (NUS, NTU, A*STAR, SUTD, and others). This elevation aims to pull together expertise from across the universities and A*STAR to position Singapore at the forefront of scientific enquiry and innovation.

Engineering Capabilities - National Quantum Office

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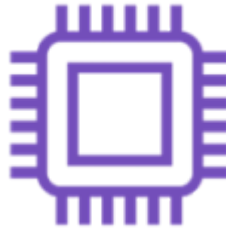
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2. Engineering Capabilities

Thematic grant calls will be launched by the National Quantum Office with a focus on critical **components and technologies** as well as applications in the following three pillars:



Quantum Communications and Security



Quantum Processors, Computation and Simulation



Quantum Sensing and Metrology

National-level quantum programmes as **focal points** to drive translational activities

National Quantum Sensor Programme (NQSP) *New*

National Quantum Processor Initiative (NQPI) *New*

National Quantum Computing Hub (NQCH)

National Quantum Federated Foundry (NQFF)

National Quantum Safe Network Testbed (NQSN Testbed)

NATIONAL-LEVEL QUANTUM PROGRAMMES

New National-Level Quantum Programmes

Two new national-level quantum programmes will be established:

National Quantum Sensor Programme (NQSP)

The National Quantum Sensor Programme (NQSP) will facilitate national coordination of quantum sensing research efforts.

- GPS-free positioning and navigation
- Next-gen optical clocks



Image credit: “Lost in Tracking” or why mobile GPS is inaccurate? <https://www.nexgendesign.com/lost-in-tracking-mobile-gps>

- Highly accurate and stable motion, electric- and magnetic field sensing
- Sensor network



Image credit: Centre for Quantum Technologies, Nanyang Technological University

- High-resolution bio-imaging
- High-precision magnetoencephalography

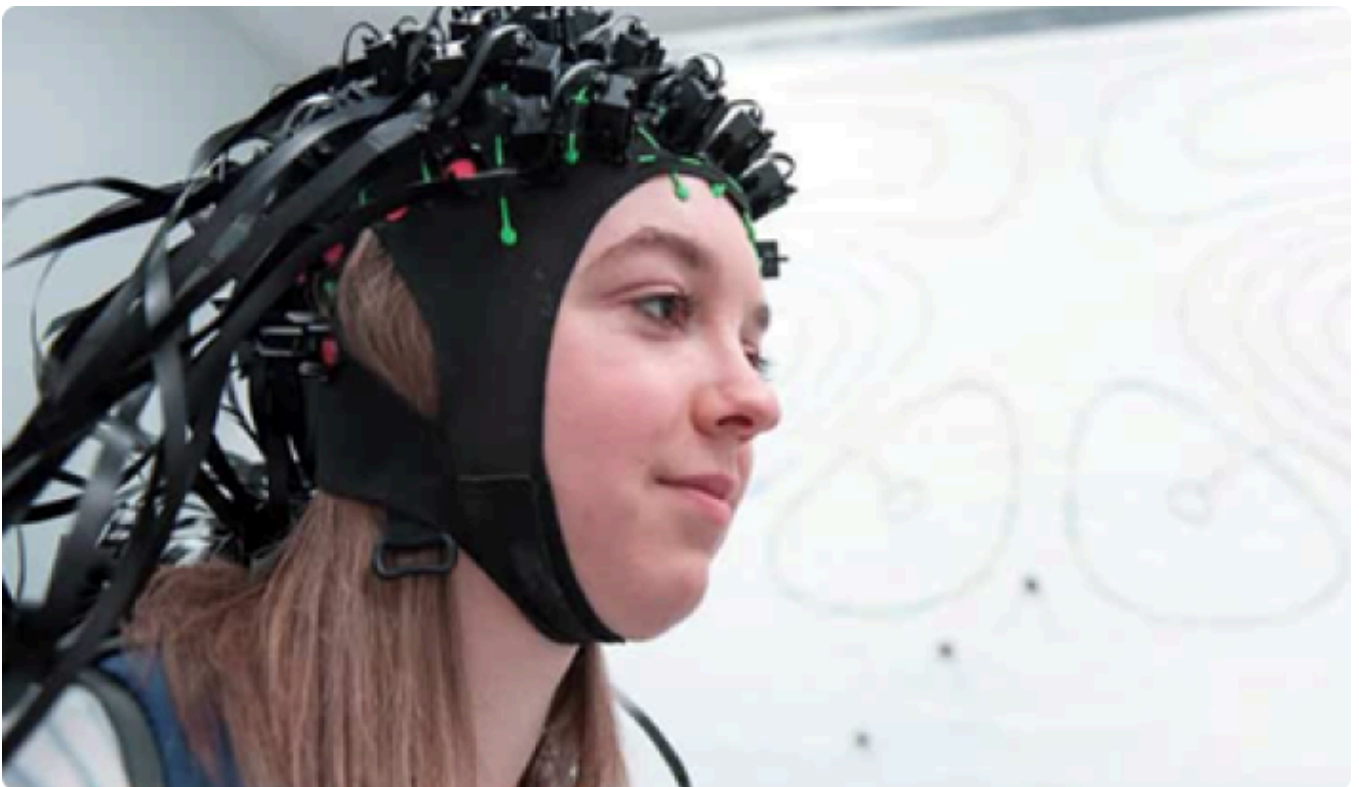
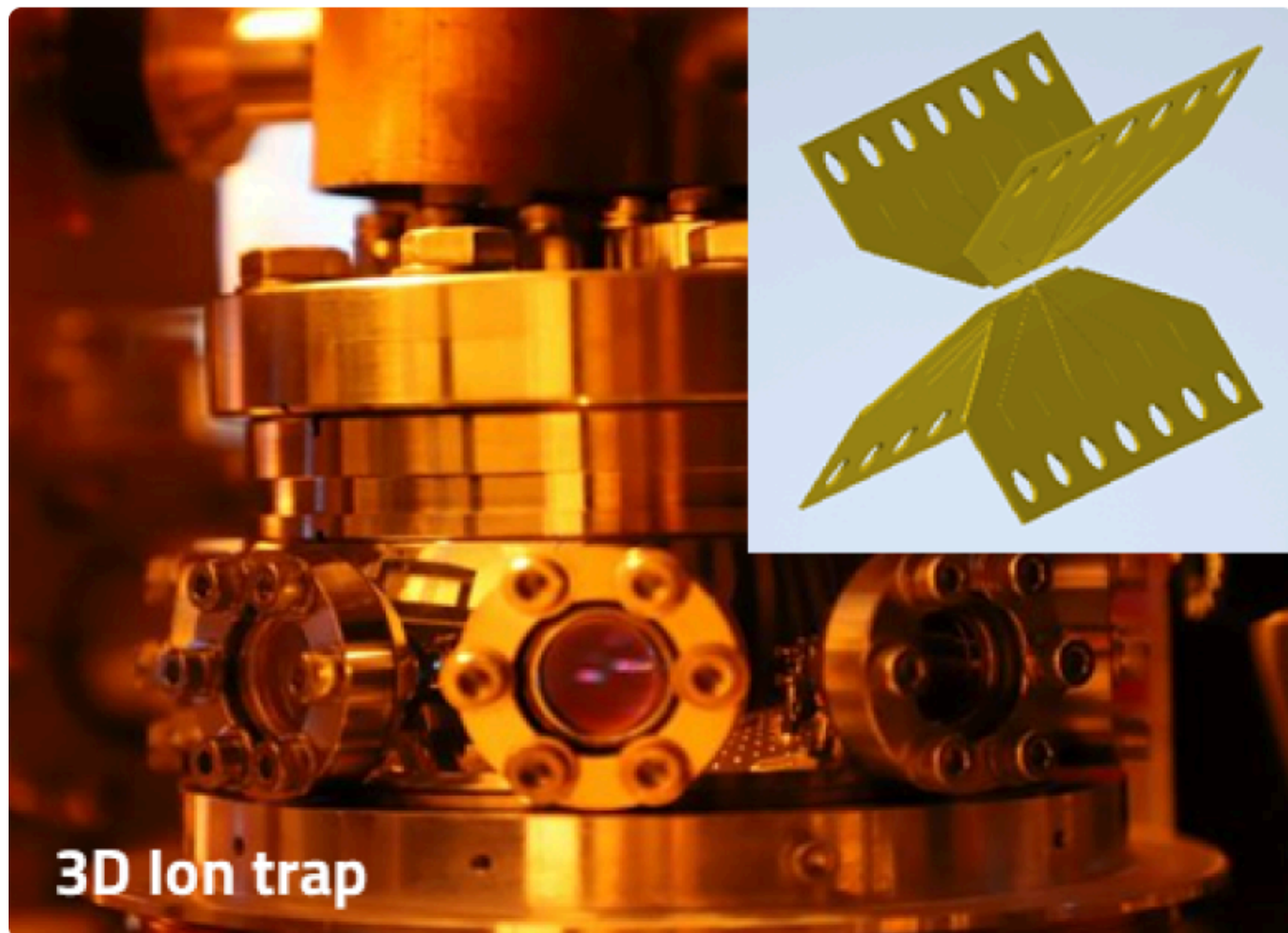
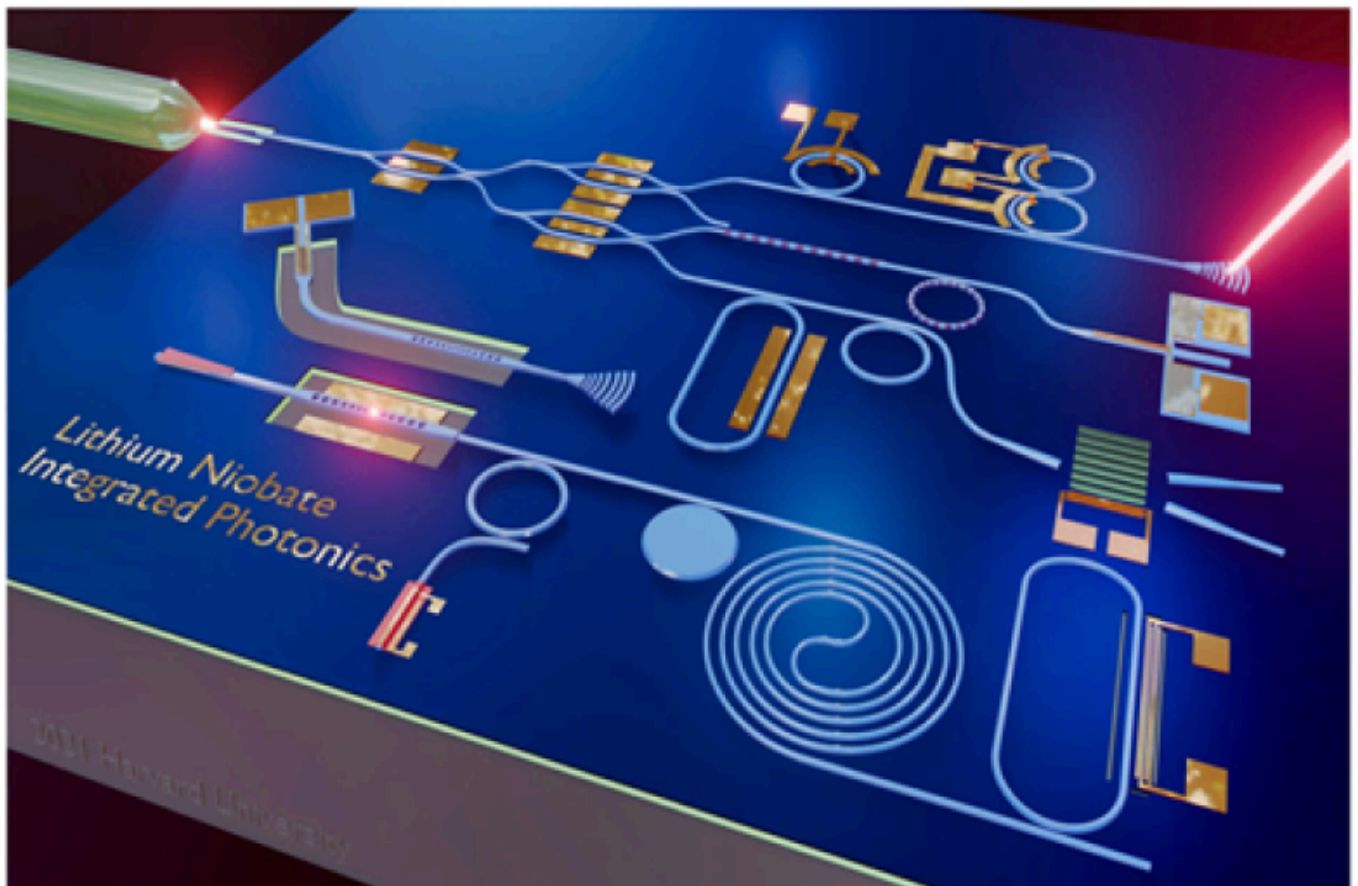
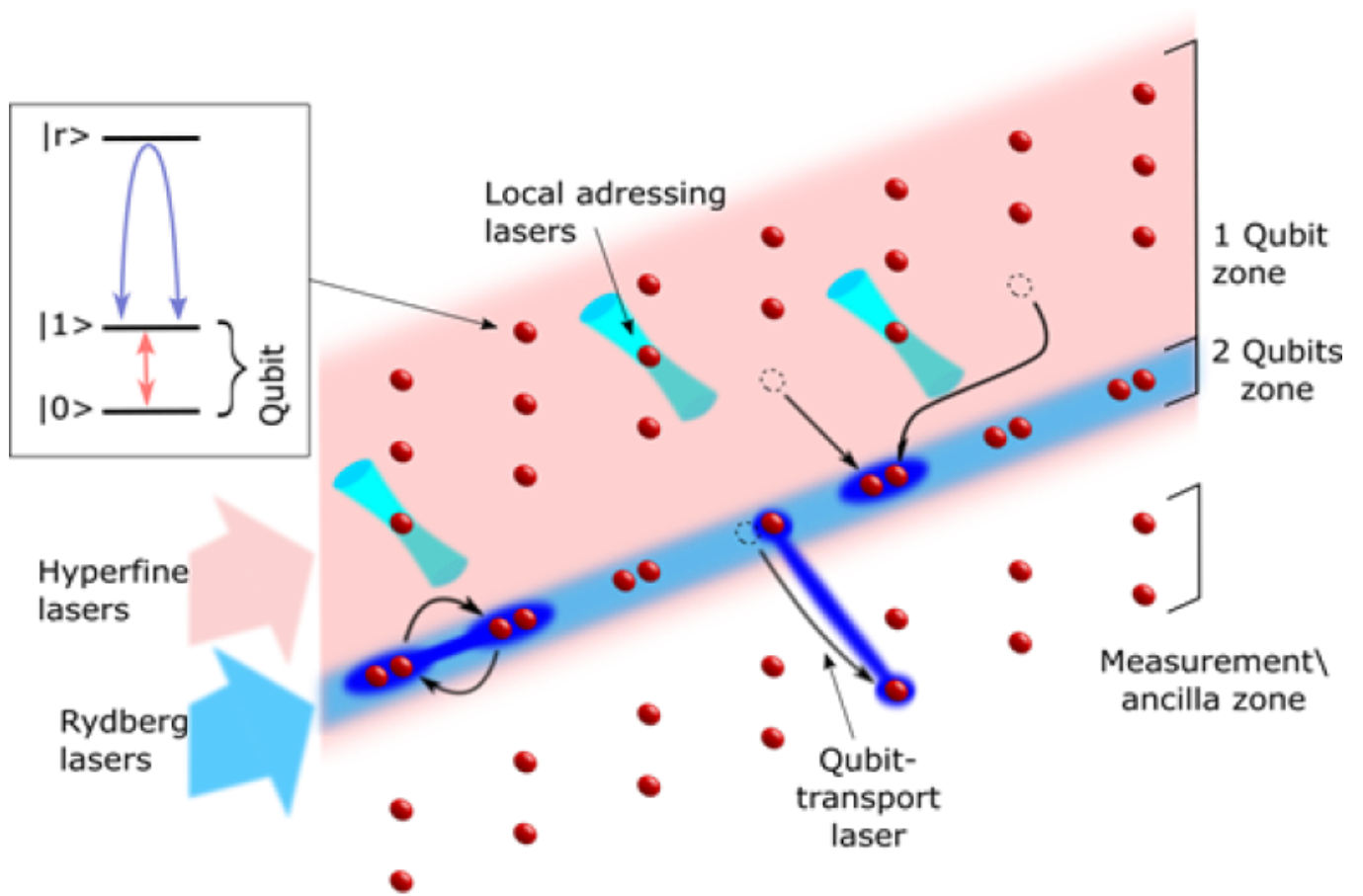


Image credit: Quantum physics gives brain-sensing MEG scanners a boost. February 2021. <https://physicsworld.com/a/quantum-physics-gives-brain-sensing-meg-scanners-a-boost/>

National Quantum Processor Initiative (NQPI)

The National Quantum Processor Initiative (NQPI) aims to develop local capabilities within Singapore to design and build a Quantum Processor.





National-Level Quantum Programmes

Under Singapore's National Quantum Strategy, the current three national-level quantum programmes – National Quantum Computing Hub (NQCH), National Quantum Federated Foundry (NQFF) and National Quantum Safe-Network (NQSN) – under the Quantum Engineering Programme will enhance their capabilities and continue to play a key role in partnering with industries to co-create meaningful quantum solutions with our research community.



NQCH will strengthen its expertise in the use of quantum computing to support use cases in Finance, Drug Discovery and Development, and Logistics.



NQFF will become a federated foundry that owns and operates fabrication tools essential to the design, fabrication and characterisation of critical quantum components and technologies. NQFF will also play an important role in supporting the technical needs of other national-level quantum programmes, such as the NQPI, and national initiatives.



NQSN will evolve into a testbed for continued scientific and engineering research in quantum communications by public and private sector end-users, and complement the NQSN+ initiative under the Infocomm Media Development Authority (IMDA).

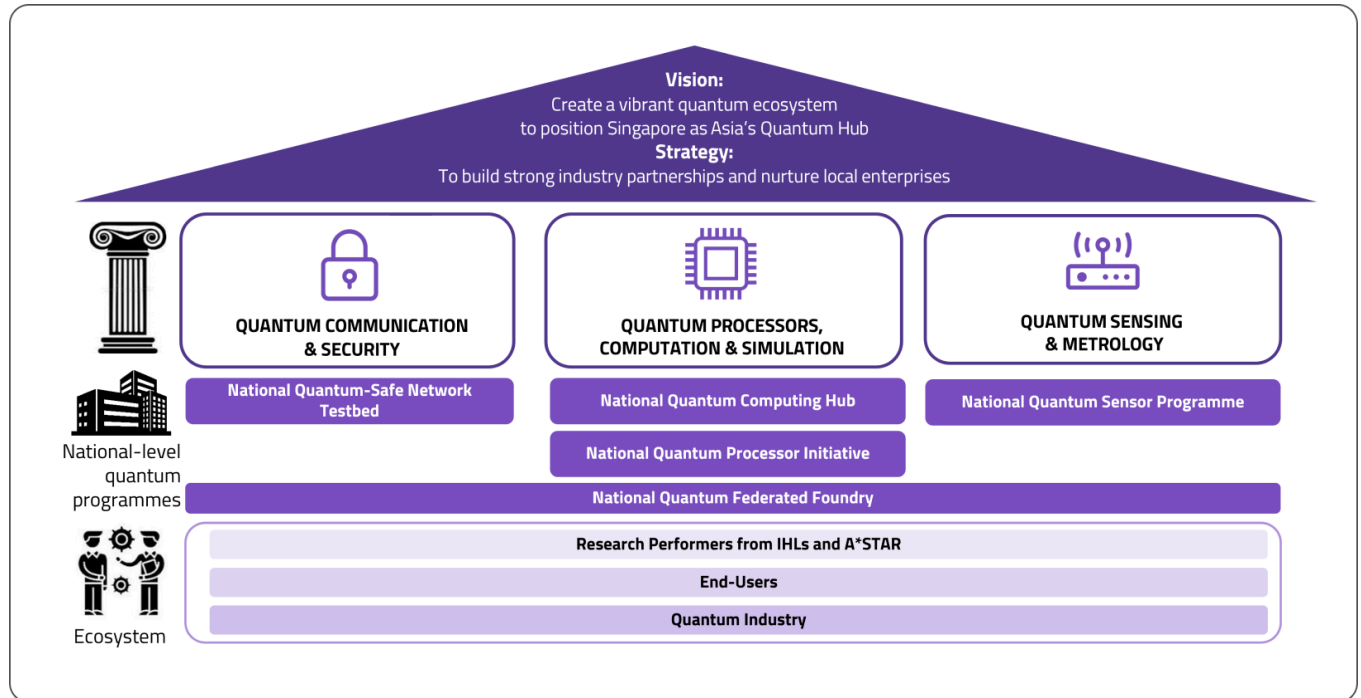
Innovation & Enterprise

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4. Innovation & Enterprise Partnerships



The National Quantum Office leverages the national-level quantum programmes to drive industry partnerships and enable the growth of the quantum ecosystem, including the nurturing of startups in quantum technologies.

Attract & Retain Talent - National Quantum Office

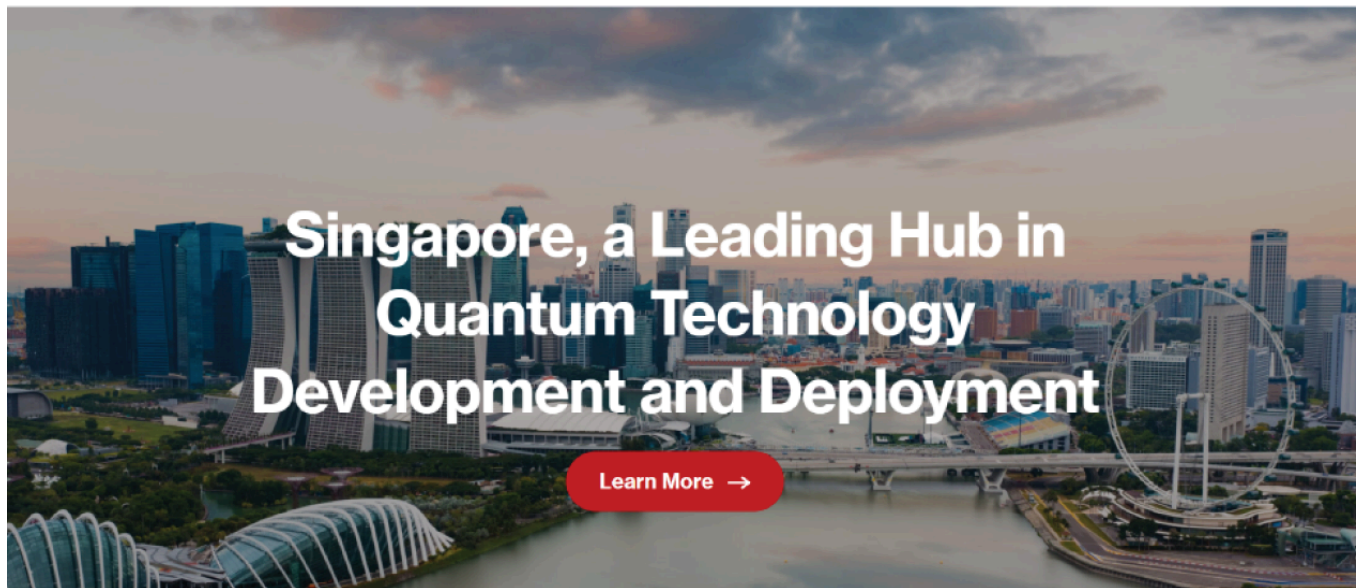
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3. Attract & Retain Talent

Talent is vital to the success of Singapore's National Quantum Strategy. A National Quantum Scholarships Scheme (NQSS) will be set up to develop a pipeline of up to 100 PhD- and 100 Master-level talents over the next 5 years to meet industry and research needs for deep-tech talent in Singapore.