

Singapore to set up first quantum computer for commercial use

It aims to speed up the discovery of new drugs and financial derivative pricing

Sarah Koh

Local firms will soon be able to harness the abilities of a new quantum computer set up in Singapore, which aims to accelerate the discovery of new drugs and financial derivative pricing.

The Helios quantum computer, which will be set up in 2026, comes under a new partnership inked between the National Quantum Office (NQO) and US-based firm Quantinuum, which builds quantum computers.

This will be the second quantum computer to be set up here and the first to be used for commercial purposes, said the two organisations and the National Quantum Computing Hub (NQCH) in a joint statement on Nov 6.

“It will significantly expand Sin-

gapore’s research and development scope, enabling scientists and companies to tackle larger, more complex and industry-relevant problems,” said NQO’s executive director Ling Keok Tong.

Unlike traditional computers that store information as either zeroes or ones, quantum computers use quantum bits (or qubits) to represent and store information in a complex mix of zeroes and ones simultaneously.

As the number of qubits grows, a quantum computer becomes exponentially more powerful.

It is able to examine countless number of possibilities to pinpoint a probable solution in hours while a traditional computer would take hundreds and thousands of years to do so.

Quantum computers have been tipped to lead new discoveries in



A rendering of the quantum computer that will be set up in 2026 under a new partnership between the National Quantum Office and US-based firm Quantinuum. PHOTO: COURTESY OF QUANTINUUM

fields such as medicine, materials and more sophisticated artificial intelligence.

In the initial phase, NQO and Quantinuum will be working with

researchers from organisations such as A*Star’s Institute of High Performance Computing to focus on potential commercial applications such as drug discovery, finan-

cial modelling, and optimisation and logistics.

Quantum computers can directly simulate complex molecular interactions because of the natural similarity between qubits and electrons, said Professor Jose Ignacio Latorre, director of the National University of Singapore’s Centre for Quantum Technologies.

In finance and optimisation, quantum algorithms can process and test a wider range of variables faster, said Mr Ling. For instance, it can give rise to more efficient and accurate decision-making in portfolio optimisation or logistics planning.

Singapore has invested \$700 million in quantum technology research since 2002, with the most recent \$300 million top-up in 2024 to be spent on studies, grooming local experts and research grants.

So far, the country’s first quantum computer run by NQCH is used mostly for research purposes, including testing, validating and benchmarking quantum algo-

rithms, said Mr Ling.

Along with the new quantum computer, Quantinuum will also set up a new R&D and operations centre in one-north, which is slated to open in the first quarter of 2026.

It is looking to hire an undisclosed number of engineers, software specialists and researchers to be based in Singapore to support its customers here.

The new centre will also serve as the base where the company’s staff, local researchers and industry partners will come together to co-develop commercially relevant quantum solutions.

The partnership between NQO and Quantinuum will also seek to develop local talent through internships, workshops and conferences to build a strong pipeline of quantum specialists, said the organisations in their joint statement.

To strengthen the nation’s digital growth and security, Singapore will continue to invest significantly in quantum technology, said Minister for Digital Development and Information Josephine Teo in the Nov 6 joint statement.

“We do this by collaborating with global partners on frontier tech, developing and attracting world-class talents, and uplifting our local workforce and enterprises,” said Mrs Teo, who is also Minister-in-Charge of Cybersecurity and Smart Nation Group.

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