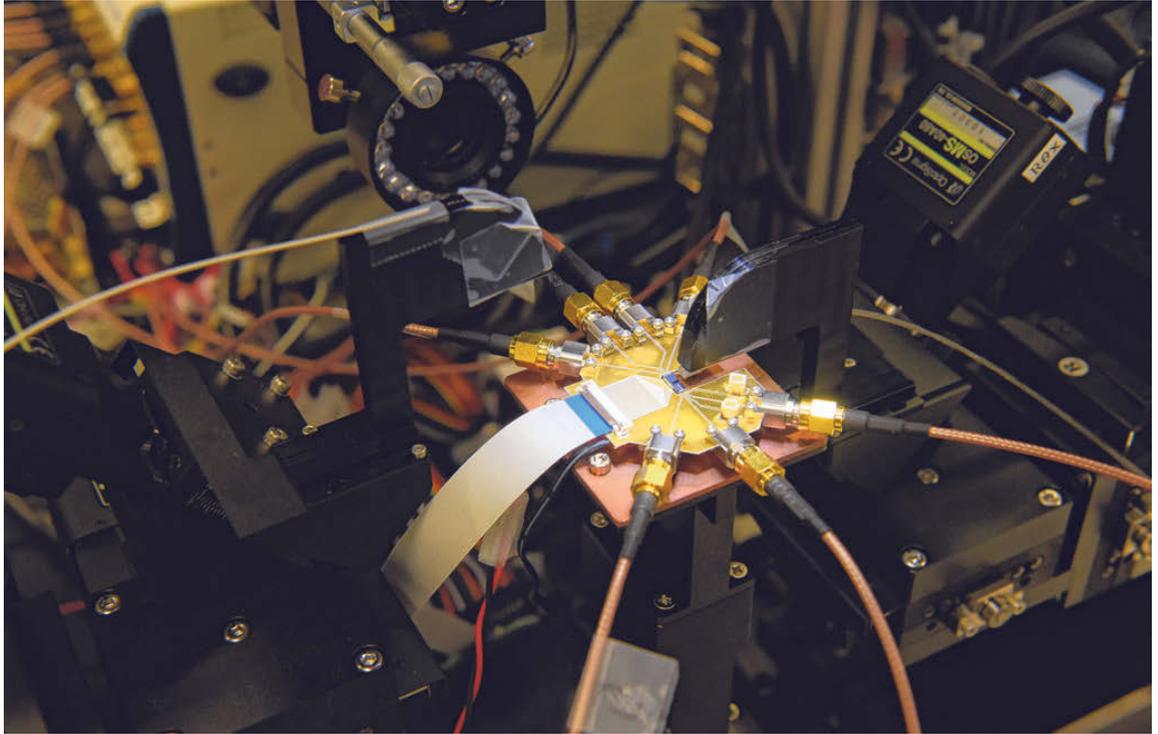


KEY AREA OF FOCUS

**A key focus area of the centre will be photonic chips, or chips that exploit the quantum properties of light particles, instead of electrical currents that conventional chips in our computers and smartphones use.**



**NTU PRESIDENT SUBRA SURESH**, on Nanyang Technological University's Quantum Science and Engineering Centre.



## NTU launches centre for quantum research and chip development

Ng Wei Kai

Microchips smaller than fingernails that can predict stock performance, encrypt data and model networks like Covid-19 clusters have been developed at Nanyang Technological University's (NTU) Quantum Science and Engineering Centre.

The centre – also known as QSec – was officially opened by Education Minister Chan Chun Sing yesterday, and it will conduct more research on developing more chips that use quantum technology.

NTU president Subra Suresh, speaking at the centre's launch, said Singapore aims to be a leader in quantum research, adding that since 2018, the National Research Foundation has invested more

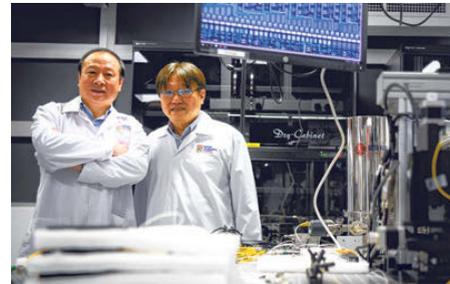
than \$120 million in quantum engineering.

QSec has been operating since 2018, but its official launch was delayed because of the Covid-19 pandemic.

Professor Suresh added that a big challenge for researchers is translating advances in the field into real-world solutions, and QSec aims to develop chips that close these gaps and improve potential for commercialisation.

He said: "A key focus area of the centre will be photonic chips, or chips that exploit the quantum properties of light particles, instead of electrical currents that conventional chips in our computers and smartphones use.

"Developing these chips and seeking ways to fabricate them at scale will open the doors for the



Above: This chip produced at Nanyang Technological University's Quantum Science and Engineering Centre is used to encrypt messages using quantum technology.

Left: Professor Liu Ai Qun (far left) and Associate Professor Kwek Leong Chuan are co-directors of the Quantum Science and Engineering Centre.

ST PHOTOS: MARK CHEONG

technology to be used in devices such as computers or sensors."

The chips developed at the lab use light instead of electricity to send information, which makes them faster.

Associate Professor Kwek Leong Chuan, the principal investigator at the Centre for Quantum Technologies at the National University of Singapore, said the chips are also greener as they use less electrical power.

Prof Kwek, who also works with NTU and is co-director of the NTU

centre, added: "They also produce less heat, which means that less energy is required to cool them."

NTU researchers at the centre have so far produced chips that use light to encrypt information through a process known as quantum key distribution. The method allows users to exchange secret keys, which will scatter and become useless if intercepted, said the university.

The researchers have also created a quantum computer chip known as the Merlion, whose mark-

ings vaguely resemble the silhouette of the Singapore icon. It can process complex networks, such as connections within large Covid-19 clusters.

The centre houses 30 researchers and is jointly funded by a Ministry of Education grant and by NTU.

Prof Suresh said it will also train a pipeline of talent with technical skills and offer outreach to students in secondary schools to generate interest in the field.

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