

# Singapore-made device survives rocket explosion

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**Device embedded in satellite has been found, intact and still working, on US beach**

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A Singapore-made device thought to have been destroyed in a rocket explosion last year has been found intact and still operational.

Last October, scientists at the Centre for Quantum Technologies (CQT), National University of Singapore, were horrified when the Antares rocket exploded just seconds after take-off from a launch pad in Virginia, in the US.

The unmanned rocket had been bound for the International Space Station with 2,300kg of supplies, equipment and science experiments, including CQT's sandwich-sized device which was meant to test if "entangled" light particles can be produced in space.

This is the first step towards establishing quantum cryptography – a potentially safer way of transmitting encrypted data – over global distances.

The CQT scientists thought their 300g device, embedded in a Danish satellite called GomX-2 in the rocket, and costing \$12,000, had been lost. But they have been told that the satellite was found on a beach near the launch site and returned to GomSpace, the company in Denmark that built it.

Assistant Professor Alexander Ling, a CQT principal investigator, told *The Straits Times*: "Just after the SG50 weekend, our Danish col-

leagues rebooted the satellite, and they sent us some data."

The CQT scientists had collected data with the device before it was placed in the rocket. By comparing the two sets of data, they concluded that the device was intact and still working.

"We don't know how the device survived the explosion, but this has validated the years of careful design that was put into the project," said Dr Ling. "We are now very confident that if our next device reaches space, it will work."

There have been different explanations for the rocket explosion – from excessive wear to the engine to debris gathering inside it.

After the GomX-2 satellite was found, it had to be cut out of the deployment mechanism, "so the impact must have been substantial", Dr Ling said.

"But the satellite itself was hardly damaged. It had a few dents and some sand inside, and everything was bent a few millimetres, but it ran without any repairs being done," he said.

He added that the CQT team has no plans to re-use the device, since it has now been "over-qualified" through its survival. "We agreed the GomX-2 satellite should not be disassembled at this time, as it yields greater value in being tested as a whole unit, so this copy of our instrument will remain in Denmark for some time," he said.

The CQT is developing its own quantum experiment satellites, with one due to be ready by 2017.

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The GomX-2 satellite with the NUS Centre for Quantum Technologies' device in it. The \$12,000 device was feared to have been destroyed when the Antares rocket carrying the satellite exploded last October.

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