

In a first, RRI transfers quantum encryption key safely between buildings | India News - Times of India

Chethan Kumar | TNN | Updated: Feb 21, 2021, 20:49 IST
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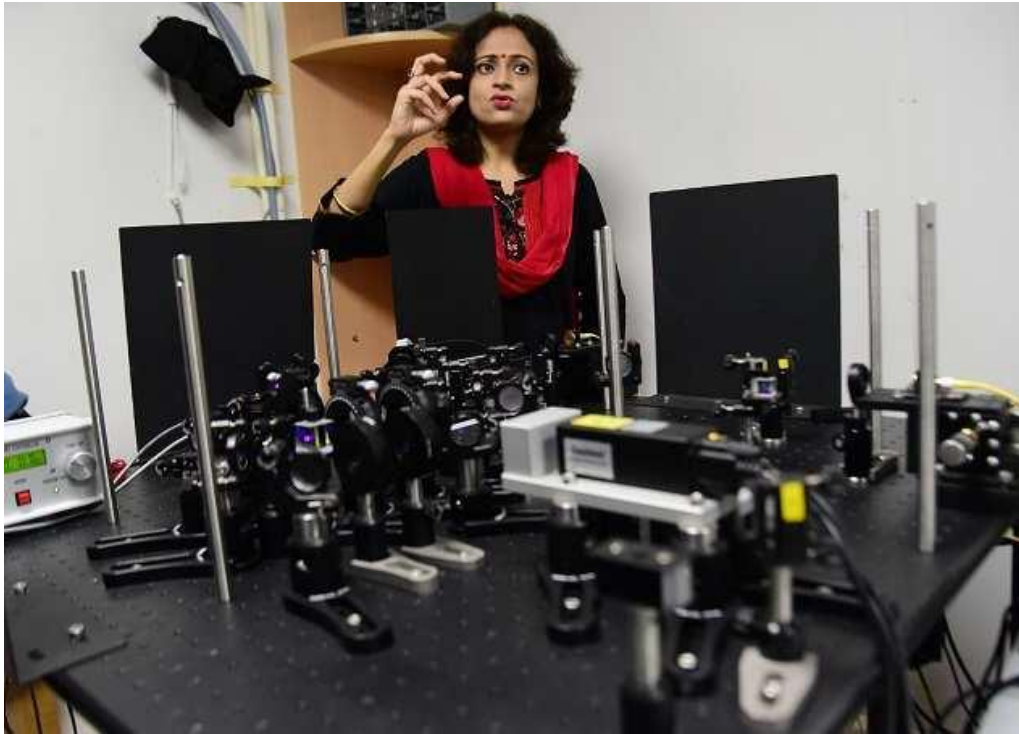
BENGALURU: For the first time in India, scientists part of the Quantum Experiments using Satellite Technology (QuEST) project from the Raman Research Institute (RRI) have claimed a breakthrough that will enable safe communications across strategic sectors ranging from banking to [defence](#).

Scientists claimed that this will be an important stepping stone towards the Centre's vision of connecting up different nodes in the country through free space and fibre based channels. "This is poised to revolutionise security for strategic sectors like banking, defence services, cyber security as well as for applications involving the common man, which need to be kept safe from unwanted intrusions," they said.



Working on [quantum cryptography](#) — encrypting a message in a way nobody can read it at the quantum (minimal level of a unit in [physics](#)) level — the scientists have demonstrated the ability to share this secret key “safely” to another building.

QuEST, carried out by RRI's Quantum Information and Computing (QuIC) lab led by Prof Urbasi Sinha, is India's first project on satellite-based long distance quantum communications. Started in 2017, QuEST is being implemented in collaboration with [Isro](#).



The TOI had reported in 2020 that Sinha's team had developed a toolkit that enabled safe quantum keys distribution (QKD) — transfer of secret key that allows reading of encrypted messages — safely between devices.

In what's the most exciting breakthrough in the QuEST journey, the team has now successfully demonstrated free space QKD between two buildings at RRI — 50 metres apart — across an atmospheric free space channel, Sinha said, after demonstrating the technology on Sunday. "This is India's first reported free space quantum key distribution experiment which connects two buildings using an atmospheric channel. This is a breakthrough milestone for the QuEST as this will pave the way for longer distances using atmospheric channels, ultimately culminating with ground to satellite based secure quantum communications," Sinha added.

The breakthrough assumes importance because quantum technologies are poised to revolutionise life as we know it, quantum computers are vulnerable.

"We need to counter such problems with a security strategy that is future secure and uses as its basis completely revolutionary ideas. Quantum Cryptography provides a solution to the problem as here the security is based on laws of nature or laws of Physics and not on the mathematical hardness of problems. This thus revolutionises security as we know it, providing a paradigm change to the existing architectures," RRI said.

While the team had already achieved competitive key rates and error rates with their in-lab version last year, this atmospheric channel based experiment has overcome several scientific and technological challenges to make this possible.