HMJ Newsletter 05’2025 – New Frontiers

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„Nature” ; 23 April 2025

Article

Long-distance coherent quantum communications in deployed telecom networks

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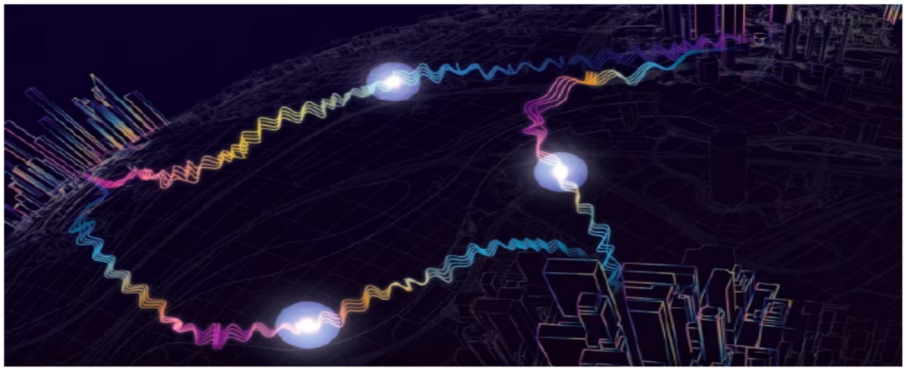
Recent advances in quantum communications have underscored the crucial role of optical coherence in developing quantum networks. This resource, which is fundamental to the phase-based architecture of the quantum internet[1], has enabled the only successful demonstrations of multi-node quantum networks[2–4] and substantially extended the range of quantum key distribution (QKD)[5]. However, the scalability of coherence-based quantum protocols remains uncertain owing to the specialized hardware required, such as ultra-stable optical cavities and cryogenic photon detectors. Here we implement the coherence-based twin-field QKD protocol over a 254-kilometre commercial telecom network spanning between Frankfurt and Kehl, Germany, achieving encryption key distribution at 110 bits per second.

„Financial Times” ; 23 April 2025

Quantum technologies

Secure ‘quantum messages’ sent over telecoms network in breakthrough

Researchers harness quantum mechanics to create communications system that can avoid being hacked



Toshiba Europe researchers have used so-called quantum key distribution cryptography to transfer messages over traditional communication systems © Toshiba Europe

Michael Peel

Published 2 HOURS AGO
Updated 16:46

Scientists have sent messages encrypted using principles of quantum physics over a 250km German commercial telecommunications network, in a milestone towards next-generation data security.

„Wall Street Journal" ; 23 April 2025

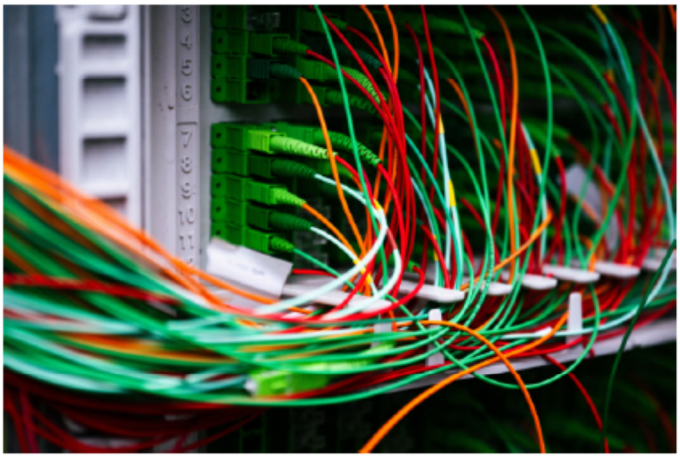
SCIENCE

In a First, Scientists Sent Quantum Messages a Record Distance Over a Traditional Network

Breakthrough brings down the cost of quantum communication and integrates it into existing infrastructure

By Aylin Woodward Follow

April 23, 2025 11:00 am ET



Quantum data was sent over an ordinary telecom network with fiber-optic cables. PHOTO: JULIE SEBADELHA/AGENCE FRANCE-PRESSE/GETTY IMAGES

Key Points

What's This?

- Scientists achieved quantum communication across 158 miles using existing fiber-optic cables.
- The method uses a standard telecom network and avoids expensive cryogenic cooling typically required.
- Quantum cryptography may solve the problem of sensitive data falling into the wrong hands.