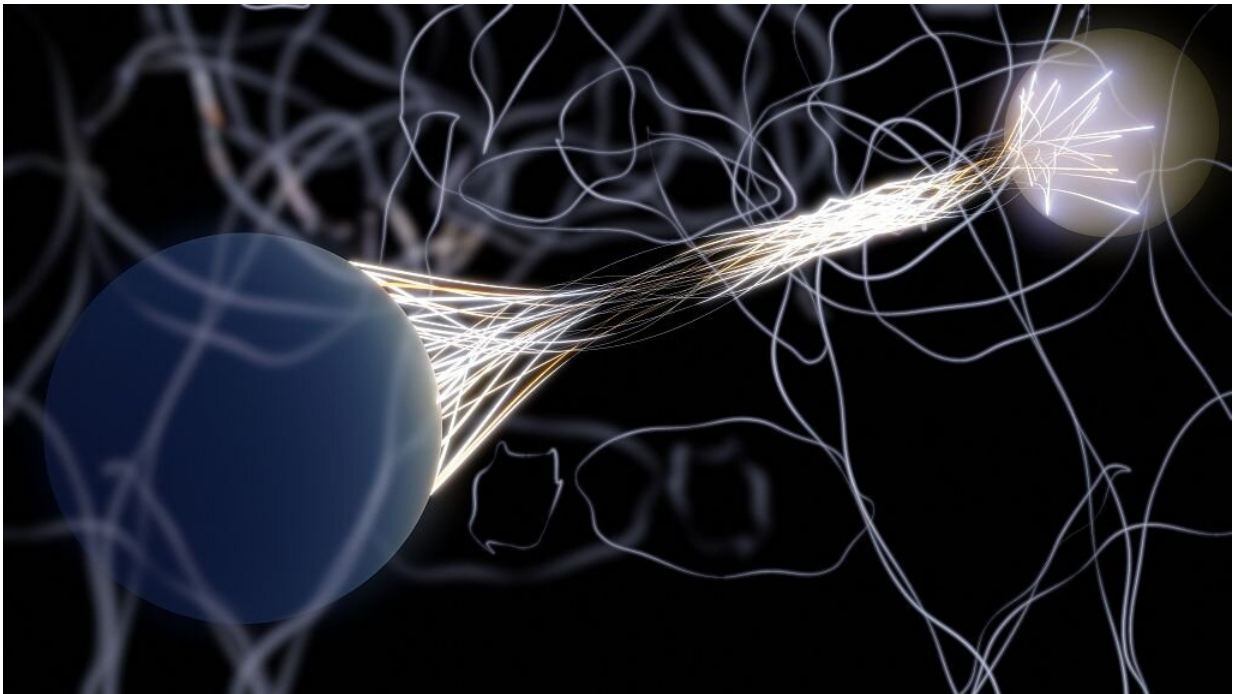


# Scientists realize faster method for quantum key distribution

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A demonstration of quantum entanglement, a key mechanic behind quantum communication. Credit: CFP

Chinese scientists have successfully implemented a new way of quantum key distribution (QKD) which can boost the speed of intercity quantum networks.

Quantum network is known for its strong resistance against

eavesdropping—theoretically, it's completely hacker-free. Data transferred through this kind of [network](#) is encrypted, with the decryption key transferred through [quantum mechanics](#).

Current QKD methods have limited distances and can be challenging to implement, but the new method demonstrated hope to solve these problems.

The new method, named mode-pairing QKD (MP-QKD), was first proposed in 2022 by a research team led by Dr. Ma Xiongmeng at Tsinghua University. It does not require a technically challenging step called "phase locking" to be implemented.

The team cooperated with another team led by Professor Pan Jianwei, a pioneer in quantum communication in China, to put the new method into practice, and the performance was outstanding.

Details of the test were published in the scientific journal *Physical Review Letters*.

In the paper, the researchers said MP-QKD can achieve a "quadratic improvement" in key-rate—basically the [speed](#) of QKD—over traditional measurement-device-independent QKD (MDI-QKD) when used in metropolitan and intercity networks.

The new method also performs faster on longer distances like 300 to 400 kilometers, with a speed boost by three orders of magnitude, the paper said.

The paper added that MP-QKD can be achieved with "off-the-shelf lasers," thus is a "ready-to-implement" technology.

The scientists expect the new technology to be "widely used" in future

intercity quantum networks.

**More information:** Hao-Tao Zhu et al, Experimental Mode-Pairing Measurement-Device-Independent Quantum Key Distribution without Global Phase Locking, *Physical Review Letters* (2023). [DOI: 10.1103/PhysRevLett.130.030801](https://doi.org/10.1103/PhysRevLett.130.030801)

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