

British Quantum Communication Fiber Optic Red Light Source with Low Temperature Resistance



Overview

Scientists at the University of Bristol have developed an optical fiber-based single photon source which can operate in ambient room temperatures. This technology is capable of producing single photons at speeds of up to 1 GHz, making it suitable for high-speed, secure. Semiconductor quantum dot (QD) quantum light sources have long been established as suitable candidates for many quantum information applications, due to the on-demand emission of highly pure and highly indistinguishable single and entangled photons. Single-photon emitters quantum mechanically connect quantum bits (or qubits) between nodes in quantum networks. Now, researchers have developed an ytterbium-doped optical fiber at room. We demonstrate the distribution of single-photon-level pulses from a mode-locked laser source over a phase-stable fiber link, achieving an optical timing jitter of less than 100 as over 10 minutes of data accumulation. This stability enables a fidelity greater than 0. 1. Using this platform, we transmit all four BB84 polarization states from an InAs quantum dot over 340 m with 0.



Article Content

Streamlined method to directly generate photons in

The proposed method uses a single rare-earth ion, trapped inside a tapered optical fiber, to directly generate and guide single photons within the

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Quantum Communication with Quantum Dots Beyond Telecom

In this letter, we propose and demonstrate a novel approach using hollow-core fibers (HCFs) with widely separated low-loss windows to transmit strong classical light at 1550 nm alongside QD single

Inside Science

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Fiber Optics Fundamentals: SMF, MMF & Link Budget

Fiber optic cables are essential components in modern data transmission infrastructure. They support high-speed, interference-resistant

Recent progress in quantum photonic chips for quantum

Here, we provide an overview of the advances in quantum photonic chips for quantum communication, beginning with a summary of the prevalent photonic integrated fabrication platforms

Phase-Stable Optical Fiber Links for Quantum Network Protocols

Our results mark a necessary step towards scalable, high-rate quantum networks with a provable quantum advantage.

New Quantum Light Source Paves the Way to a

Researchers develop the first 2D telecommunication-compatible quantum light source, smoothing the path toward a quantum internet.

Optical-fiber based single-photon light source at room temperature for ...

"In this study, we have developed a single-photon light source using an optical fiber material doped with optically active RE elements. Our experiments also reveal that such a source can...

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Entanglement-based intercity quantum key distribution: Metrology and ...

In this paper we present our work demonstrating the transfer of quantum cryptographic information over a 78 km optical fiber, as a base for future long distance public quantum links, using

Optical fibers fit for the age of quantum computing

However, these wavelengths are not compatible with the operational wavelengths of the single-photon sources, qubits, and active optical

Fiber-coupled quantum light sources based on solid

Against this background, this review article presents the current status of the development of fiber-coupled quantum light sources based on solid-state

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Optical fibers fit for the age of quantum computing

A new generation of specialty optical fibers has been developed by physicists to cope with the challenges of data transfer expected to arise in the future age of quantum computing.

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Using quantum technologies to improve fiber optic communication systems ...

We discuss the near future impact that recent developments of quantum technologies can have in the field of fiber optic communication systems. The ability to generate, manipulate,

Streamlined method to directly generate photons in

Since this method uses commercially available optical fibers, it is cost-effective, wavelength selectable, and straightforward to integrate into a fiber

New Low-Cost, Efficient Single-Photon Source for Powering Future ...

Researchers at Tokyo University of Science have developed a fiber-coupled single-photon source that generates single photons directly inside an optical fiber, reducing transmission

Telecom-band quantum dot technologies for long

Therefore, the development of high-performance telecom-band quantum dot devices is highly desirable for a future solid-state quantum internet

(PDF) Optimized designs for telecom-wavelength

Our results show prospects for the fabrication of close-to-ideal fiber-coupled quantum light sources for long distance quantum communication.

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Scientists achieve breakthrough on quantum signaling

Researchers developed a room-temperature quantum communication device, removing the need for super-cooling and enhancing practical

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A Breakthrough in Room Temperature Optical Fiber-Based Single

A recent breakthrough in quantum technology has made a major step towards the next generation of secure communication. Scientists at the University of Bristol have developed an optical

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Quantum communication across a 250-kilometre optical

23 April 2025 Quantum communication across a 250-kilometre optical-fibre network
Quantum communication over long distances can be achieved by exploiting a

Made at the University of Bath: Optical fibres fit for the

A new generation of specialty optical fibres has been developed by physicists at Bath to cope with the data transfer challenges expected from

A Quantum Light Source for Quantum Information Applications in the ...

Initial experiments in this work demonstrated single-photon emission of a QD light source emitting directly in the telecom C-band, under both continuous wave (CW) and 1-GHz pulsed

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