

Currently the highest communication capacity of optical fiber cables



Article Overview

The current highest communication capacity achieved in optical fiber is 1.02 petabits per second over 1,808 kilometers using a 19-core optical fiber.

Record-Breaking Transmission

An international research team led by the National Institute of Information and Communications Technology (NICT) in Japan, in collaboration with Sumitomo Electric and several universities, set a new world record by transmitting 1.02 petabits per second (Pbps) over a distance of 1,808 km using a specially designed 19-core optical fiber with a standard 0.125 mm cladding diameter, compatible with existing fiber infrastructure (NICT, 2025) . This achievement represents the fastest long-distance transmission ever recorded in optical fiber.

Technology Behind the Record

- Multi-core fiber: The 19-core fiber allows multiple independent light paths within a single cladding, multiplying the data rate without increasing the fiber diameter.
- Low-loss across multiple wavelength bands: Optimized core arrangement reduces signal attenuation in both C-band and L-band wavelengths.
- Optical amplification system: A novel amplification relay was developed to simultaneously boost signals from all 19 cores, enabling long-distance transmission without significant signal degradation.
- Capacity-distance product: The experiment achieved a 1.86 exabits per second x...

Article Content

Feb 13, 2026

NICT and NTT announce world records for ultra-large-capacity optical ...

The paper reported the achievement of the world's largest transmission capacity, reaching 22.9 petabits per second

Apr 22, 2026

World Record 402 Tb/s Transmission in a Standard Commercially

This record was achieved by constructing the first optical transmission system covering all the transmission bands

May 20, 2026

Fiber Optic Cable Speeds: Everything You Need to Know

This comprehensive guide explores fiber optic cable speeds, comparing performance capabilities, technical factors,

May 12, 2026

What is maximum data capacity for optical fiber cable?

Over the years, the data transfer rates of Fiber Channel connections have significantly improved. The maximum

Oct 26, 2025

Fiber-Optic Cable Bandwidth: Complete Guide

What is the maximum bandwidth for fiber-optic cables? Current commercial systems support up to 800 Gbps per

Oct 29, 2025

Newly-Developed Optical Fiber Can Carry More Than 10 Million Fast

That's a million times more capacity than TAT 8. But it's still not enough to meet the demand for streaming TV, video

Aug 08, 2025

World Record Achieved in Transmission Capacity and Distance: With

Sumitomo Electric Industries, Ltd. and the National Institute of Information and Communications Technology (NICT;

Apr 05, 2026

"World record" for data transmission speed | ScienceDaily

Researchers have sent data at a record rate of 402 terabits per second using commercially available optical fiber. This

May 05, 2026

What Is Fiber Optics? A Guide

Fiber optic cables are often used to transmit data and control signals in environments where high-powered motors,

Apr 20, 2026

World Record 402 Tb/s Transmission in a Standard Commercially

An international joint research team led by the Photonic Network Laboratory of the National Institute of Information

Sep 30, 2025

World Record Achieved in Transmission Capacity and Distance: With

Highlights The world's first successful petabit-class transmission over more than 1,000 km using standard 19-core

Sep 26, 2025

Reaching the pinnacle of high-capacity optical transmission using a ...

Here, the authors demonstrate petabit/s transmission in a standard-sized 19-core multi-core fiber, while minimizing the

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World record transmission capacity and frequency bandwidth

The transmission capacity and frequency bandwidth achieved in this experiment are 25% and 35% higher than those

Nov 16, 2025

100 Million Zoom Sessions Over a Single Optical Fiber

A few also operate in the L band from 1568 to 1605 nm, most notably the world's highest-capacity submarine cable,

Oct 19, 2025

Japan sends 1 million GB of data across 1,100 miles in a second

A total capacity of 1.02 petabits per second over 1,808 km was achieved, setting a new world record for optical fiber

Feb 07, 2026

Multi-mode optical fiber

Applications The equipment used for communications over multi-mode optical fiber is less expensive than that for single-mode

Jul 23, 2026

How Fiber Optic Cable Transmits Data at high speeds

Fiber optic cables are essential for today's digital communications. With the ability to support superior transmission

Apr 27, 2026

World Record Achieved in Transmission Capacity and Distance: With

To date, Sumitomo Electric has developed a randomly coupled 4-core optical fiber, a randomly coupled 7-core optical

Mar 04, 2026

Fiber Optics and Types

Fiber optic cables are used for long-distance and high-performance data networking. They are capable of transmitting

May 20, 2026

Fiber Optic Cable Bandwidth Explained | A Complete Guide

To answer the question, bandwidth is calculated in gigabits per second (Gbps) or terabits per second (Tbps) for extremely high

Sep 29, 2025

World Record Achieved in Transmission Capacity and Distance: With

With a capacity-distance product of 1.86 exabits per second x km—the highest ever recorded —this demonstration

Feb 10, 2026

What is The Maximum Data Capacity for Optical Fiber Cable

The maximum capacity of a single optical fiber cable, based on physical principles, reaches hundreds of terabits per

Jan 10, 2026

How can optical fibers increase network capacity? | Nokia

More recently, fiber optic cable suppliers have managed to design and implement cables that utilize high density

Dec 06, 2025

New optical fiber cable transmits at the speed of 17 million internet ...

New optical fiber cable transmits at the speed of 17 million internet connections It has 19 cores which can each carry a

Feb 01, 2026

Fiber Optic Data Rates Reach New Record Speed

An international team of researchers have smashed the world record for fiber optic communications through commercial

Nov 14, 2025

What Is Fiber Optic Cable?

A fiber optic cable is a network cable that contains strands of glass fibers inside an insulated casing. They're designed

Nov 09, 2025

Maximum theoretical bandwidth of fibre-optics

Ignoring hardware at either end and their technological limitations, what is the maximum theoretical bandwidth of fibre

Apr 06, 2026

255Tbps: World's fastest network could carry all of the internet's ...

A joint group of researchers from the Netherlands and the US have smashed the world speed record for a fiber

Dec 17, 2025

Nokia Bell Labs sets world record in fiber optic bit rates

In addition to these world records, Nokia Bell Labs researchers have also recently achieved significant achievements

Sep 26, 2025

Reaching the pinnacle of high-capacity optical transmission using a ...

Space division multiplexing offers increased capacity over current fiber networks. Here, the authors demonstrate

Apr 29, 2026

Exploring Fiber Optic Bandwidth Capacity and Limitations

Is fiber optic internet the best choice? High bandwidth is just one reason why fiber internet is the superior choice for

Sep 08, 2025

Fiber Broadband Scalability and Longevity

The longevity of fiber optic cabling infrastructure has already exceeded 35 years since the first deployments and we expect the

Aug 23, 2025

Japanese Institute breaks optical fiber speed record with 22.9 petabits ...

Tech Industry Manufacturing Japanese Institute breaks optical fiber speed record with 22.9 petabits per second —

Apr 25, 2026

Optical Fiber Communications – data transmission, capacity, telecom ...

Optical fiber communications are the technology of transmitting information through optical fibers. Huge data rates are achieved with

Sep 02, 2025

Fiber-optic cable

Different types of cable are used for fiber-optic communication in different applications, for example long-distance

Jan 03, 2026

YOFC Achieved World's First 1.2Tb/s Per-Wavelength

On June 16, Yangtze Optical Fibre and Cable Joint Stock Limited Company (YOFC) announced the successful

Mar 28, 2026

Ultra-high-capacity Optical Communication Technology

Data-communication capacity is increasing at an annual rate of 10%, and it is expected to increase exponentially on the full-scale

Apr 27, 2026

Fiber-Optic Cable Bandwidth: Complete Guide

Fiber-optic cables significantly enhance bandwidth, making them essential for achieving high fiber-optic speeds in

Contact Us

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