By Mike Brown for Inverse

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A new fiber optic technology could enable high-speed internet access to travel further without requiring electricity-powered signal boosters.

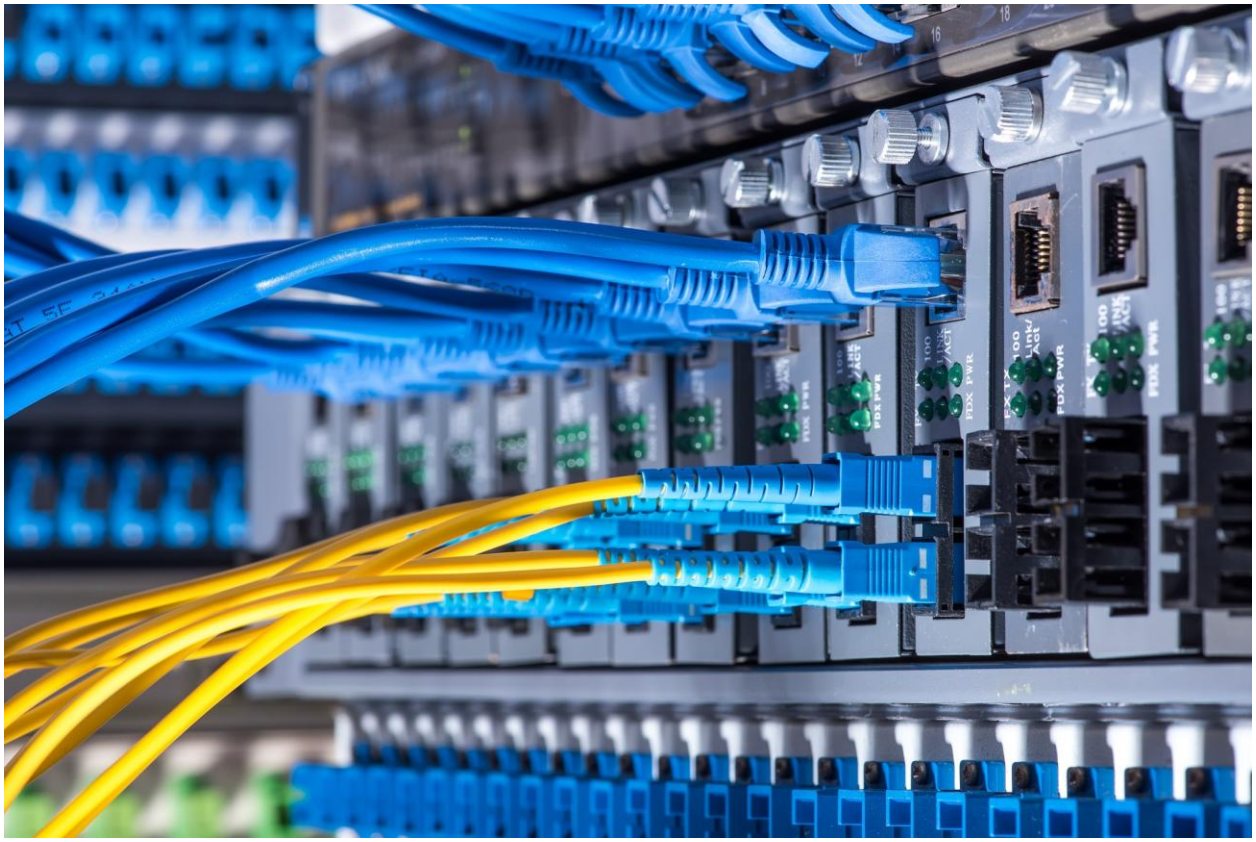
The Moscow Institute of Physics and Technology announced this week they have successfully transmitted a signal over the high-tech wires at a distance of 323 miles at 200 gigabits per second. That beats current real-world transmission systems that can manage 100 gigabits per second over 311 miles. It also brings the sort of high speeds previously demonstrated in research labs out into commercial cables. The team's findings were published in *IEEE Photonics Technology Letters*.

The breakthrough could help connect up rural areas that might otherwise struggle to get online. Alzbeta Fellenbaum, principal analyst for IHS Markit, a London-based data broker, tells *Inverse* that fiber optics could offer a better means of plugging the gap than other options like cellular towers.

"There have been some hopes recently that fixed wireless access (FWA) over LTE/4G (or 5G in the near future) could solve the poor rural connectivity issues, but for very large countries like Russia or Canada with vast sparsely populated areas, this might be a more suitable solution," Fellenbaum says.

However, as with most breakthroughs of this nature, readers would be advised to exercise caution before they move to the wilderness.

“In general, I would say that achieving 200Gbps in a commercial real-conditions setting is very impressive and could narrow the connectivity gap considerably,” Fellenbaum says. “However, as with everything, it would be the cost of deploying it and the price presented to the consumers determining the viability of this solution.”



Fiber optic cabling in action.Shutterstock

It could prove the perfect breakthrough for big countries with sparse populations. Fellenbaum notes that around 50 percent of Russian households are subscribed to a fixed broadband service. Around 95 percent of homes have access to a fixed broadband service of two megabits per second or faster, while 75 percent have access to speeds 30 megabits per second or higher.

It’s a similar story in Canada. The national regulator CRTC notes that 98.7 percent of households have access to speeds faster than 1.5 megabits per second, a figure that drops to 84.1 percent for 50 megabits per second or faster. In rural areas, just 37.2 percent of homes have access to these high speeds.

The team worked with engineers from Russia-based T8 and United States-based Corning to deliver the solution. Corning is perhaps best known as the developer of Gorilla Glass, the smartphone glass used on the iPhone and other devices. The company accounted for around 45 percent of the smartphone glass market as of 2017. T8 develops communications equipment that can reach high speeds of up to 600 gigabits per second.

The team used commercial cables developed by Corning. The connection comprised three sections, with each one packing two kinds of fiber optic cables in series. Remote optically pumped erbium amplifiers were used in between each section, the first one placed 76 miles from the transmitter and the other 81 miles from the receiver.

Although it could potentially support speeds of up to 400 gigabits per second, the group limited the speeds to 284 gigabits per second to ensure it could move further over a long distance.

“We are already working on a fiber optic system that would achieve higher transfer rates,” T8 CEO Vladimir Treshchikov said in a statement. The team aims to reach 600 gigabits per second with the new system. It’s also hoping to set a new transmission distance record next year.

But could laying high-speed cable prove an outdated method before it’s even started? Fellenbaum says that another solution “would be the low-orbit satellite connectivity provided by SpaceX or OneWeb, as they have accelerated their efforts in the last year.”

With SpaceX set to start providing global Starlink satellite internet as early as 2021, the race to connect the most remote areas could soon hit high speed.

Abstract:

This letter demonstrates unrepeatered real-time transmission of 200 Gb/s (5 bit per symbol modulation format, 56.8 GBaud) signal over terrestrial 520 km single-span fiber link. This was achieved using ultra low-loss fibers with large effective area, ROPAs with dedicated fibers, and distributed Raman amplifiers with co- and counter-propagating pumps.