

## National Laboratory for Optical Fiber Cables



### Overview

The Argonne quantum loop consists of a pair of connected 26-mile fiber-optic cables that wind circuitously between Argonne to the Illinois tollway near Bolingbrook, IL, and back. At 52 total miles, it is currently among the longest ground-based quantum communication channels in the. Could fiber-optic cables detect moonquakes?

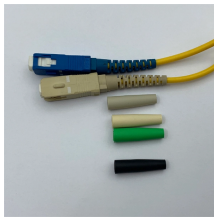
Fiber-optic cables lie on the surface and beneath crushed basalt in an indoor lab at Los Alamos National Laboratory to determine whether they could be used on the surface of the moon to detect moonquakes. The crushed basalt simulates the lunar surface. Courtesy/LANL LANL News: Two recent studies. More than 3.4 billion people are connected to the Internet, placing ever-increasing demand on the telecom industry to provide bigger, better and faster bandwidth to users. Lawrence Livermore National Laboratory (LLNL) researchers have taken an important step in addressing that need by developing a. Argonne scientists, (left to right) Sean Sullivan, Gary Wolfowicz, Joseph Heremans and Alan Dibos, worked on the quantum loop project and demonstrated the operation of the testbed by generating, transmitting, and

detecting optical pulses through one and then both fiber loops. Smaller in diameter than a human hair, these fibers can transmit light pulses of information at billions of pulses per second and over distances of several thousand kilometers, eclipsing what is possible with electrical cables. Optical fibers are used on Earth and in space for applications in medicine, defense, cybersecurity, and telecommunications.

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Earlier this year, Lawrence Livermore National Laboratory (LLNL) seismologist Gene Ichinose and his team plugged a device known as an interrogator into a 50-mile-long fiber-optic ...



Preliminary results have been promising. From mid-February to mid-March, the investigation manufactured a total of more than seven miles (11.9 km) of optical fiber. Eight of the ...



Lawrence Livermore National Laboratory (LLNL) researchers have taken an important step in addressing that need by developing a new type of optical fiber amplifier that could potentially double ...



Ichinose showed us the footprint of a recent 3.9 magnitude earthquake in the East Bay. It was captured, not by a traditional seismograph, but the kind of fiber optic cable that might carry...



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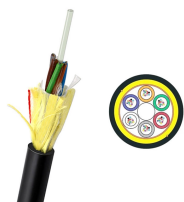
Fiber-optic cables deployed far from a landing site could help fill that gap by providing data on how widely debris spreads. Donahue and her Los Alamos colleagues are now exploring how ...



Scientists at the Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab) are developing sensing technologies consisting of fiber-optic cables, which could be installed on ...



To address these challenges, NSF-supported researchers are leveraging the existing telecommunication fiber-optic infrastructure in Pittsburgh as a novel underground sensor network to ...



Initial results have been promising, and successful ZBLAN fiber production on the ISS National Lab could pave the way for future large-scale commercial manufacturing of ZBLAN in low Earth orbit.



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