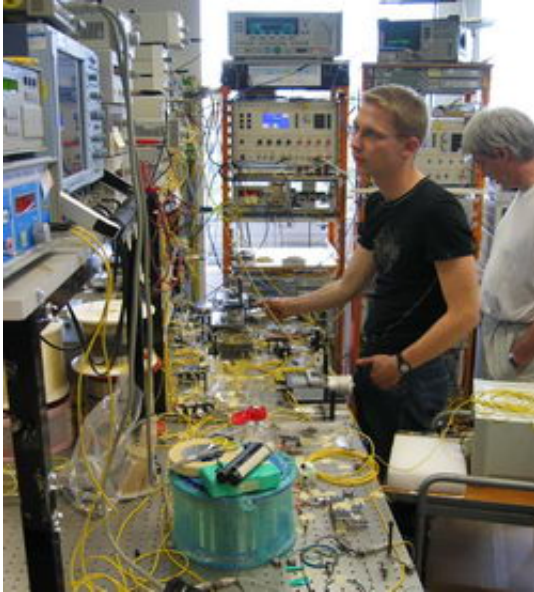


# Fiber-optic network sets world record

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Laboratory for data transmission at 2.56 terabits per second. © Fraunhofer HHI

As Internet traffic grows exponentially, so high-speed data transmission becomes crucial. Fraunhofer researchers (Germany) are now using new technology that supports speeds of 2.56 terabits per second over fiber-optic cables - the equivalent of 60 DVDs.

Growth of the Internet community is relentless. Around 700 million people regularly accessed the World Wide Web in 2004. Since then the number of users has grown by another 20 percent.

To enable telecommunications networks to cope with the phenomenal

surge in data traffic, researchers are focusing on new systems to increase data transmission rates.

"You transmit data at various wavelengths simultaneously in the fiber-optic networks. For organizational and economic reasons each wavelength signal is assigned a data rate as high as possible", explains Prof. Hans-Georg Weber from the Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut HHI in Berlin, who heads a project under the MultiTeraNet program funded by the Federal Ministry of Education and Research.

A few weeks ago the scientist and his team established a new world record together with colleagues from the company Fujitsu: For the first time they transmitted a data signal at 2.56 terabits per second over a 160-kilometer link – equivalent to 2,560,000,000,000 bits per second or the contents of 60 DVDs. By comparison, the fastest high-speed links currently carry data at a maximum 40 Gbit/s, or around 50 times slower. The Berlin-based group has smashed the existing record of 1.28 terabits per second; the record held previously by a Japanese group of researchers stood for five years.

Data is transmitted in fiber-optic cables using ultrashort pulses of light and is normally encoded by switching the laser on and off. A pulse gives the binary 1, off the 0. You therefore have two light intensity states to transmit the data. The Fraunhofer researchers have now managed to squeeze more data into a single pulse by packing four, instead of the previous two, binary data states in a light pulse using phase modulation."

"Faster data rates are hugely important for tomorrow's telecommunications", explains Weber. The researcher assumes the transmission capacity on the large transoceanic traffic links will need to increase to between 50 and 100 terabits per second in ten to 20 years.

"This kind of capacity will only be feasible with the new high-

performance systems."

Source: Fraunhofer-Gesellschaft

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