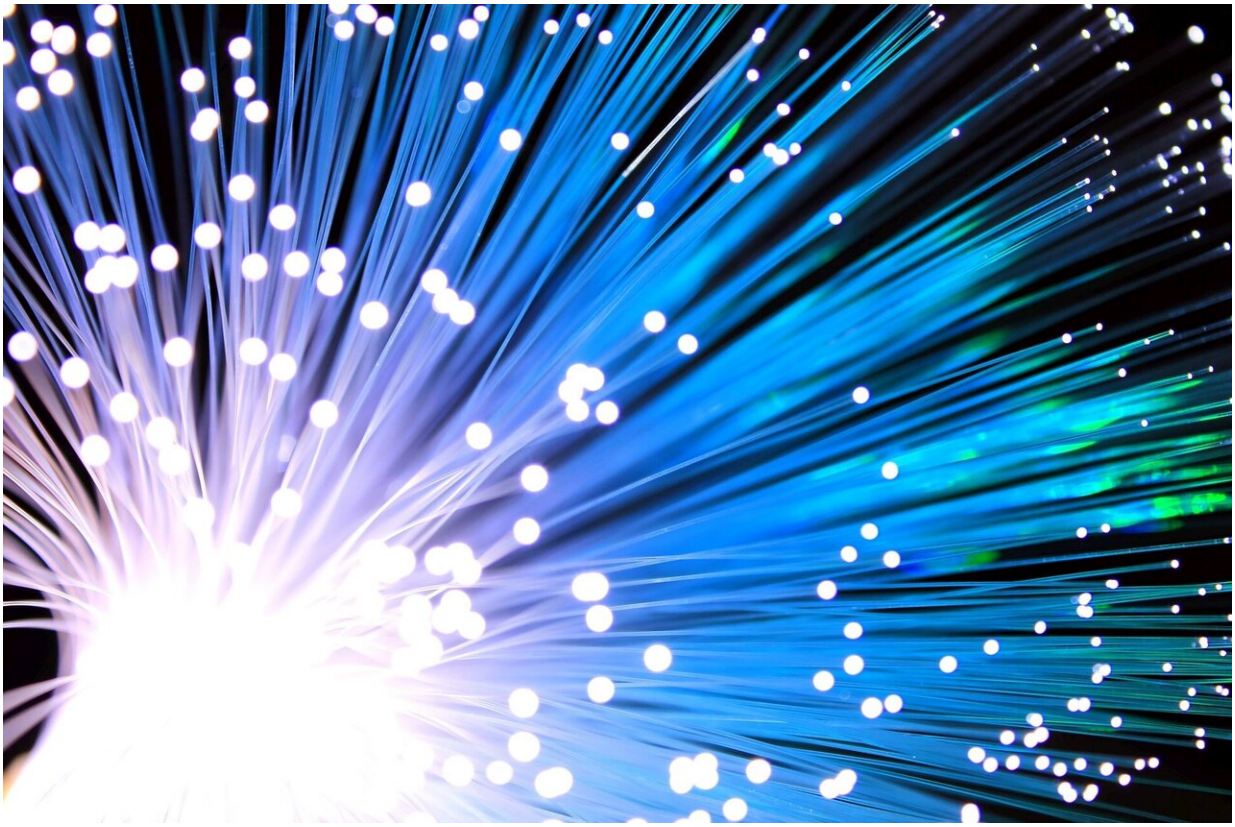
Record-breaking chaotic data transmission

May 29 2019, by David Bradley



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Engineers in China have used a chaos-based system to pipe data securely through a fibre-optic at a rate of 1.25. gigabits per second across a distance of 143 kilometres.

Hongxi Yin, Qingchun Zhao, Xiaolei Chen, Hehe Yue, and Nan Zhao of

the Lab of Optical Communications and Photonic Technology, School of Information and Communication Engineering, Dalian University of Technology, and their colleagues Dongjiao Xu and Ying Chang of HAEPC Information and Telecommunication Company, in Zhengzhou describe details of the achievement in the International Journal of High Performance Computing and Networking. The team points out that their greatest success in this physical form of encryption was in the use of off-the-shelf components. They add that this keeps costs down significantly. Moreover, there is no need to use dispersion compensating fibre (DCF) or forward-error correction (FEC).

The researchers offer a rationale for the need to develop such high-speed, long-distance secure optical communications technology. High-speed secure message transmission and exchange is they suggest, an essential part of modern life at the individual, business, organisational, and governmental levels. "Modern information networks provide convenience for personal message transmission, national economic and technological development, national defence construction, battlefield communications and so on," they explain. However, it also brings new problems, such as personal information, governments, enterprises, defence and other secure message leaks and attack. "These have been a serious threat to economic, technological development and social stability, and even national defence security," the team writes.

The record-breaking physically encrypted transmission of 1.25 gigabits per second over 143 kilometres is a major advance. The team, however, points out that they can achieve double that data rate over a shorter range, 25 kilometres. It is only a matter of time and development before the longer distance can sustain the higher data rate.

More information: Hongxi Yin et al. 1.25 Gbits/s-message experimental transmission utilising chaos-based fibre-optic secure communications over 143 km, *International Journal of High*

Performance Computing and Networking (2019). DOI: 10.1504/IJHPCN.2019.099738

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