

London scientists build 'ultra broadband nearly three million times faster' than UK home fibre optic internet connections

The research leader at UCL who amplified the way light carries data said achieving supercharged transfer speeds was key to providing a 'backbone' for demanding 5G networks powering driverless cars and smart cities

Scientists in London claim to have achieved the world's fastest-ever internet speed - quick enough download the entire Netflix library a split second.

A [University College London](#)-led team used amplifiers to enhance the way light carries digital data through fibre-optic **broadband** to achieve a record 178 terabits per second - almost three million times faster than the average UK home connection.

Dr Lidia Galdino, who led the research team at a lab in Bloomsbury, said such "ultra broadband" will underpin the next generation of the internet, supporting mobile 5G networks used by data-hungry applications such as driverless cars and smart cities infrastructure.



The new record was achieved by transmitting data in a greater range of colours than is typically used in optical fibre in order to increase the bandwidth.

For the speed test, Dr Galdino sent computer-generated bits in a 25-mile fibre optic loop around a Bloomsbury lab.

Dr Galdino said she hoped the giant leap in speed will help create 'fast internet for all' (James Tye/UCL)

The massive speed increases were made possible by building customised amplifiers to boost signal power, which would be needed at least every 25 miles if deployed commercially.

It meant her super-speeds - the equivalent of 178 million megabits per second - were about 2.8 million times faster than the Ofcom-rated average 64mbps British home broadband connection.

Dr Galdino told the Standard: "I managed to achieve the highest bandwidth that has ever transmitted through the internet.

"I think the societal benefit is clear - fast internet for all and a more productive economy.

"It's important because internet traffic and data has been increasing exponentially over the last 10 years but we have reached the theoretical limit.

"The one other way to increase the capacity in optical fibre is increasing the range of wavelengths and colours that we can use, which is exactly what I've done.

“This is underpinning the next generation of communication systems.”

A global race is underway to make ultra-speed broadband networks available commercially.

In May, a team in Australia used a single “micro-comb” optical chip containing hundreds of lasers to transfer data across existing networks in Melbourne at a speed of 44.2 terabits per second.

UCL said its new speed is so great that this connection would take under an hour to download scientific data from the world’s first image of a black hole in space, taken using a global network of telescopes, which needed to be stored on half a ton of computer hard drives.

Dr Galdino, lecturer in electronic and electrical engineering and also a Royal Academy of Engineering research fellow, is now working to increase the distance her super-fast data can be sent over greater distances.

The project’s findings, in collaboration with telecoms firms **Xtera** and KDDI Research, were published in the journal IEEE Photonics Technology Letter.

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