

From the desk lamp to the desktop?

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In the future, getting a broadband connection might be as simple as flipping on a light switch. In fact, according to a group of researchers from Germany, the light coming from the lamps in your home could one day encode a wireless broadband signal.

"The advantage is that you'd be using [light](#) that is already there," says Jelena Vučić of the Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institute in Germany. Vučić and her colleagues have found a way to get the most from this synergy of illumination and information and will be presenting their findings during the Optical Fiber Communication Conference and Exposition/National Fiber Optic Engineers Conference (OFC/NFOEC), which will take place March 21-25 in San Diego.

As of now, the majority of wireless in homes and businesses is achieved through a radio-frequency WiFi connection. But WiFi has limited bandwidth, and it's unclear where to find more in the already-crowded radio spectrum. By contrast, visible-frequency wireless has all the bandwidth one could want. The signal would be generated in a room by slightly flickering all the lights in unison. No one would be bothered by this because the rate of modulation would be millions of times faster than a human eye can see. Since visible light can't go through walls like radio, there would be no unwanted interference from stray signals and less worry of outside hackers.

Incandescent and fluorescent bulbs can't flicker fast enough, so all the lights would have to be LEDs. Although commercial LEDs have a

limited bandwidth of only a few MHz, Vučić and her colleagues were able to increase this [bandwidth](#) ten-fold by filtering out all but the blue part of the LED spectrum. With the visible wireless system built in their lab, they downloaded data at a rate of 100 Mbit/s. They have now upgraded the system's receivers and are getting 230 Mbit/s, which is a record for visible wireless using commercial LEDs. Although state-of-the-art radio wireless can achieve comparable speeds, Vučić says they should be able to double their data rate again by employing a more sophisticated modulation signal.

Provided by Optical Society of America

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