

High-performance microring resonator developed by INRS researchers

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A new, more efficient low-cost microring resonator for high speed telecommunications systems has been developed and tested by Professor Roberto Morandotti's INRS team in collaboration with Canadian, American, and Australian researchers. This technological advance capitalizes on the benefits of optical fibers to transmit large quantities of data at ultra-fast speeds.

The results of the team's work, just published in the prestigious journal [Nature Photonics](#), will facilitate the transition from electronic to optical communications, the future solution for meeting the growing needs of Internet and cellphone users.

The microring resonator investigated by Professor Morandotti's team at INRS's Energy, Materials, and Telecommunications Center in Varennes, Quebec, and by his colleagues, offers several advantages. Made from a special glass with exceptional optical properties, this key [signal transmission](#) component can be incorporated into the microchips used extensively in telecommunications systems. Furthermore, it is fabricated using the same methods as those employed by silicon chip manufacturers, thereby reducing optical component costs and making the technology more affordable.

The new resonator has the additional advantage of using a single low-power [laser](#) source to obtain multiple wavelengths, unlike existing devices that require very high optical power, or different devices. Furthermore, Professor Morandotti and his team have been successful in

generating a new multiple-wavelength laser source at a threshold optical power level as low as ~54mW, setting a new world record for glass devices in the process.

This technological breakthrough is crucial because it comes as electronic devices are reaching their data transmission capacity limit, whereas optical fibers offer much greater capacity and better transmission quality. In addition to revolutionizing the world of telecommunications, INRS researchers are helping create new applications in the fields of detection and metrology, including measurement applications in physics and computers, as well as instrument calibration and adjustment.

More information: The articles published in Nature Photonics are available at:

-- [www.nature.com/nphoton/journal ... photon.2009.236.html](http://www.nature.com/nphoton/journal.../photon.2009.236.html)

-- [www.nature.com/nphoton/journal ... photon.2008.228.html](http://www.nature.com/nphoton/journal.../photon.2008.228.html)

Provided by INRS

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