CMC MICROSYSTEMS IMPACT

# Researchers at Université Laval Patent Technology that Promises to Improve Data Flow Over Optical Networks

**University researchers require access to industry-grade test capability to conduct microsystems research with potential application in the multi-billion dollar photonics sector. To meet these requirements, researchers are tapping into the National Microelectronics Photonics and Testing Collaboratory managed by CMC Microsystems.**

*"Forty gigabits per second is now the industry standard for data transmission over optical networks. To perform internationally competitive research, particularly in partnership with industry, scientists must have the ability to test prototypes at this communications rate. The Testing Collaboratory enables researchers to access world-class test capability that would otherwise be unavailable."*

**Dr. Sophie LaRochelle**
**Canada Research Chair in Communications and Optical Fibre Components**
**Université Laval**

Dr. Sophie LaRochelle (left), Canada Research Chair in Communications and Optical Fibre Components at Université Laval, has designed a photonic system that addresses the signal distortion that occurs when data are transmitted over long distances through fibre optic networks. Serge Doucet (right), Research Fellow, Université Laval, is among the many researchers she is collaborating with.

TeraXion Inc. of Québec City has first rights to a new 'made-in-Canada' technology that promises to provide a competitive edge in the growing market for photonics-based equipment. The company is a technology leader in the design of state-of-the-art photonic components for fiber optic networks used in defence and industrial applications. TeraXion is partnering with Dr. Sophie LaRochelle, Canada Research Chair in Communications and Optical Fibre Components at Université Laval, on an innovative research project supported by CMC.

With funding from the Canadian Institute for Photonic Innovations (CIPI), Dr. LaRochelle and her collaborators have designed a photonic system that addresses the signal distortion that occurs when data are transmitted over long distances through fibre optic networks. The 'tunable dispersion slope compensator' system operates at 40 gigabits per second—the industry standard for the transmission of data over long-haul optical networks.

According to Dr. LaRochelle, "This technology allows you to 'tune' or adjust each communications channel individually to address signal distortion when transmitting data. The compensators currently available on the market do not provide this functionality. If you tune one channel, you alter all of them simultaneously. This can inhibit the successful transmission of data over long distances."

Following the development of a prototype, the team needed specialized test resources to validate this new technology. The team benefited from access to industry-grade photonic test equipment through the Advanced Photonic Systems Lab at Queen's University. It is one of four specialized laboratories that comprise the National Microelectronics and Photonics Testing Collaboratory managed by CMC. This virtual laboratory enables faculty members and graduate students at 21 universities across Canada to test and validate promising microsystems technologies.

"The ability to access photonic test equipment through the Collaboratory was invaluable to our team. It allowed us to validate the technology and apply for a patent, helping to increase the confidence of our industry partners. We believe TeraXion is now well-positioned to exploit this university research for application in photonics-based products." *cmc*