

Canada's photonics ecosystem: Making light work

Canada's National Design Network (NDN) and CMC Microsystems are proud contributors to global advancements in photonics innovation. This unique ecosystem enables excellent research, product and technology development, commercialization and the training of next-generation photonics innovators.

Spotlight: Research Excellence and Commercialization

For more than 15 years, Canada's NDN and CMC Microsystems have been exploring the potential of light-based technologies, from design through to prototyping. Today, the promise of photonics is being fulfilled thanks to the work of academics, their students and industrial researchers:

- High performance photovoltaic solar cells with twice the energy harvesting capacity of current solar panels (Professor Karin Hinzer, University of Ottawa).
- Integrated silicon photonics system that promises smaller, cheaper and faster optical telecommunications (Professor Andrew Knights, McMaster University).
- Vision sensor system that uses terahertz light to find previously undetectable objects and defects in advanced manufacturing processes (Professor Daryoosh Saeedkia, University of Waterloo graduate and founder, TeTechS Inc.).
- Smaller, more integrated and cost-effective components powerful enough to handle the growing demands of bandwidth-hungry data and telecommunications applications (Québec City-based company TeraXion Inc.).
- Multi-channel fiber optic links for cabling that reduce the heat and weight of copper-based cables used in real-time magnetic resonance scanning during surgery (Professor Greg Bridges, University of Manitoba).

Spotlight: Collaboration

CMC is proud to partner with photonics innovation organizations across Canada and worldwide, including:



“There is a vibrant photonics ecosystem in Canada. The transformation in products and services made possible by putting light to work increasingly has a made-in-Canada label. We're pleased to work with Canadian innovators who contribute significantly to global advances in this field. Our post-secondary institutions are exemplary in engaging their students to become the next generation of photonics innovators.”

- Dan Gale, Vice-President and CTO, CMC Microsystems

Spotlight: Training Next-Gen Innovators

Access to industry-calibre tools, manufacturing processes and collaborators for photonics research and development is enabling the next generation of innovators and startup companies. Since 2008, users of this infrastructure have benefited by having more than 400 of their designs implemented in photonics technologies.

- Researchers at University of British Columbia, in partnership with CMC Microsystems, developed the world's first hands-on silicon photonics training and fabrication course in 2008. Since then, nearly 200 people have been trained and had their designs fabricated. This initiative, led out of UBC, is part of a Canada-wide advanced training program, known as Si-EPIC.
- Master's and doctoral thesis work supported with tools and expertise from CMC Microsystems gave McGill University graduate David Rolston the experience and confidence to start his own company, Reflex Photonics, offering next-generation optical and semiconductor connectivity solutions.
- University of Toronto doctoral candidate Mohammad Alam's highly cited research into surface plasmons has provided core technology for the development of a wide variety of commercial products, including high-performance optical switches, smaller and faster communication chips, and ultra-sensitive optical biosensors for disease diagnosis.
- University of Calgary graduate student Yonathan Dattner discovered his passion for photonics through a course offered by CMC Microsystems. Today, his spinoff company Luxmux Technologies is developing an infrared sensor that could improve the efficiency of oil production in thermal enhanced heavy oil recovery.

About Canada's National Design Network

Canada's National Design Network enables the competitiveness of academic researchers and Canadian industry by enabling excellent research with a strong focus on prototyping novel, complex microsystems, and by training next-generation innovators through Network research projects and facilities.

About CMC Microsystems

CMC Microsystems, a federally incorporated not-for-profit organization, maintains, operates and manages the facilities of the National Design Network. CMC works with partners to advance micro-nano innovations from promising prototypes to larger scale developments.

Contact CMC Microsystems About Industrial Developments and Research

- Dan Deptuck, Staff Scientist, Optoelectronics Engineering | T: +1.613.530.4670 | E: deptuck@cmc.ca
- Ray Filteau, Business Development | T: +1.613.530.4789 | E: filteau@cmc.ca
- www.cmc.ca/photonics



United Nations
Educational, Scientific and
Cultural Organization



In support of

International
Year of Light
2015