

PHOTONICS – THE SCIENCE OF LIGHT



Photonics embraces the interaction of light with matter. The technology for generating, manipulating, transmitting and detecting light is poised to *revolutionize our lives*, just like the preceding electronic and digital revolutions.

Photonics represents *knowledge that challenges the imagination*, with applications ranging from the communications and entertainment systems in our homes to uses in biology, quantum computation, medicine and environmental sensing. Yet there is a lot more research needed for photonics to offer the kind of widespread and powerful applications that electronics now provides.



COLLABORATION WITH INDUSTRY, GOVERNMENT AND UNIVERSITIES



The CRPuO has extensive scientific contacts world-wide and an international network of formal partnerships and collaborations, which include the following:

Industry

- Semiconductor Insights, Canada
- JDS Uniphase Corporation, USA
- Nortel Networks, Canada
- Agilent Technologies, USA
- Cyrium Technologies Inc., Canada
- CooperVision Inc., USA

Government

- Steacie Institute for Molecular Sciences, National Research Council, Canada
- Institute for Microstructural Sciences, National Research Council, Canada
- Canadian Photonics Fabrication Centre, National Research Council, Canada
- CMC Microsystems, Canada
- Communications Research Centre Canada (CRC), Canada

Universities

- National Institute for Medical Research, UK
- École Nationale Supérieure d'Électronique et de Radioélectricité de Grenoble, France
- Universität Duisburg-Essen, Institute of Optoelectronics, Germany
- Centre for Optoelectronics and Optical Communications, UNC Charlotte, USA
- The National Hellenic Research Foundation, Theoretical and Physical Chemistry Institute, Greece
- RIKEN Brain Science Institute, Saitama, Japan
- Departamento de Física, CCEN, Universidade Federal de Alagoas (UFAL), Brazil
- Universidad Nacional Autónoma de México
- École Polytechnique de Montreal, Canada
- University of Toronto, Canada

CENTRE FOR RESEARCH IN PHOTONICS

at the University of Ottawa (CRPuO)

*Photonics:
The generation, manipulation,
transmission and detection of light*

www.photonics.uOttawa.ca



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L'Université canadienne
Canada's university

THE CENTRE FOR RESEARCH IN PHOTONICS AT THE UNIVERSITY OF OTTAWA (CRPUO)

The Centre for Research in Photonics at the University of Ottawa (CRPuO) is defining the frontier of this exciting field. Building on [the University's strengths in physics, chemistry, biology, engineering, and medicine](#), this multi-disciplinary centre is developing [the next generation of applications in photonics](#), and helps these innovations find their way into the marketplace and our everyday lives.

RESEARCH IN PHOTONICS AT THE CRPUO

- BIOPHOTONICS
- COMMUNICATIONS & NETWORKS
- DEVICES & TECHNOLOGY
- MICROWAVE PHOTONICS
- PHOTONIC SCIENCE
- SENSING SYSTEMS

Current Projects

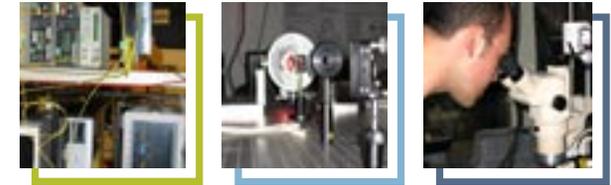
- **Communicating sound, vision and touch over optical networks** for collaborative tele-surgery training in medical areas such as ophthalmology
- **Making 'movies' of electron motion in atoms and molecules**, using natural time scales of attoseconds with applications in photochemistry and life sciences
- **Distributed fibre optic sensors for safety and security applications**, such as chemical sensing or measuring the strain and temperature of bridges and buildings
- **Enabling broadband information access (internet, telephony, cable) for all**: agile optical access and transport networks as well as radio-over-fibre for wireless communications services
- **Fast detection of explosives in complex samples**: the study of particular molecules in photochemistry to detect electron-deficient molecules that indicate the presence of explosives

Our Vision for the Future—The Best Applications and Technologies are still to Come

- Powering the world with low cost, environmentally friendly, high efficiency concentrated photovoltaics (solar cells)
- Smart dust: self-powered networked micro-sensors to measure and sense the world
- Ubiquitous embedded photonic systems: low cost optoelectronics for optically interconnected electronics
- Prevention of infections following corneal transplants or other medical procedures: development of new "photo cages" capable of releasing antiviral agents on demand

A UNIQUE TEAM

The CRPuO has already attracted [a world-class team of researchers](#) whose careers span [more than 300 years of experience](#) and include such honours as Canada Research Chairs, the Golden Jubilee Medal, and the Gerhard Herzberg Gold Medal. This critical mass of expertise is complemented by the [concentration of technology firms](#) in the National Capital Region, creating an unrivalled capability to develop and implement multi-market, multi-faceted photonic solutions.



Visit our team Web site at
www.photonics.uOttawa.ca