Centre for Optics, Photonics and Lasers (COPL)

At the COPL, physicists, chemists, engineers, technicians and graduate students work in synergy, from the confines of the infinitely small to that of the infinitely fast, to offer society the benefits of photonics technology.

Laser surgery, giant liquid crystal displays, optical fibre networks enabling high-speed Internet and videoconferencing are prime examples of the photonics revolution.

The COPL team is right at the heart of this revolution that is transforming our world by bringing people together.

CENTRE DESCRIPTION

Founded in 1989, the Centre for Optics, Photonics and Lasers (COPL) follows a long tradition of research and training excellence dating back to the 1950’s, in this field, at Université Laval.

The COPL has since evolved into a multidisciplinary strategic cluster of experts from seven Quebec universities who are collaborating toward the development of optics & photonics and the application of its technologies. Throughout the years, Université Laval has maintained a critical mass of researchers. Currently, the university has 21 research groups conducting activities in photonic materials, optical communications, laser science, fibre-optics, biophotonics, optical engineering and instrumentation.

Université Laval is continually asserting its leadership in this area, in Canada and around the world. With the opening in 2006 of a building entirely dedicated to research and training in optics & photonics, the only infrastructure of its kind in Canada, the COPL has consolidated its leadership role in the field.

MISSION

The COPL’s mission is to:

- train students and highly-qualified personnel
- perform fundamental and applied research
- contribute to socio-economic development in the field of optics & photonics

STATISTICS AT 1 JUNE 2013

21 researchers
15 research scientists
150 students
Since 2006, COPL’s professor-researchers have been conducting their multidisciplinary research activities in synergy within the Pavilion of Optics & Photonics. Over the past two years, scientific breakthroughs originating from their work have generated 12 patent applications. This number represents almost one quarter of the total patent applications filed by Université Laval during this period.

One of these discoveries is a probe capable of being guided through the meanders of the brain to reveal electric signals produced by neurons. The device was developed by the COPL in collaboration with neuroscientists at the Quebec Mental Health Institute. It was ranked among the top discoveries of 2011 in Québec Science Magazine’s annual review.

The technology is being further developed by Doric Lenses, a Quebec City-based company. Two young entrepreneurs who are COPL alumni have launched Laserax, a company specialized in laser material processing. Currently incubated in the laboratories of the Optics & Photonics building, the company already offers to the manufacturing industry custom solutions to increase operational productivity and profitability.

TLCL Optical Technologies is a company founded in 2006 by Professor Tigran Galstian, a COPL member. The company performs R&D in the area of liquid crystal-based intelligent lenses. Through a licencing agreement with Université Laval, it is developing a technology that is being marketed by the American company LensVector. Over $70 M has been invested in this innovation, which has garnered an award from the Quebec Association for Research and Innovation given to Prof. Galstian in 2013.

The exceptional quality of research conducted at the COPL has led to the recent awarding of two prestigious Canada Excellence Research Chairs, one in the area of vitreous materials and optical fibres, the other in neurophotonics.

The Centre is determined to pursue its development and to consolidate Université Laval’s reputation as a centre of excellence in the field of optics and photonics. Its researchers have therefore established a joint international unit with Brazil. In conclusion, plans to create an optics institute are currently unfolding.

With the goal of training future scientists and business leaders, the COPL regularly organizes activities that foster the entrepreneurial spirit among its students.

In addition, the COPL encourages students to take part in national and international conferences where they can present their research. They are also given the opportunity to become involved in organizing workshops and seminars chaired by COPL researchers. Such events allow students to network with renowned scientists from other laboratories around the world. Finally, the COPL is fortunate to have a very energetic student association that organizes industrial visits, conferences, training seminars and even scientific popularization workshops for pre-university students. Through such activities, students can hone their current skills and acquire new ones in management and event organization that will be useful throughout their career.

Because of the quality of its research infrastructure and the critical mass of its multidisciplinary expertise, the Centre is able to offer Master’s and PhD students an exceptional training experience. Every year, over twenty graduates complete their program and transition to jobs in industry or public organizations that reap the benefits of their knowledge and know-how.

In carrying out its role of training high-calibre scientists, the COPL constitutes a vital link in the innovation chain. The COPL prepares students to become scientists with the capacity to function autonomously. Its alumni are known to rapidly adapt to an applied work environment and to smoothly integrate into research teams. The COPL remains attuned to market needs by pursuing numerous collaborations with its partners. The Centre is therefore able to adjust its research and training projects to meet the challenges and trends faced by industry. Research partnerships offer students the opportunity to be co-supervised by scientists in industry and to gain valuable hands-on experience through internships in an industrial setting.