

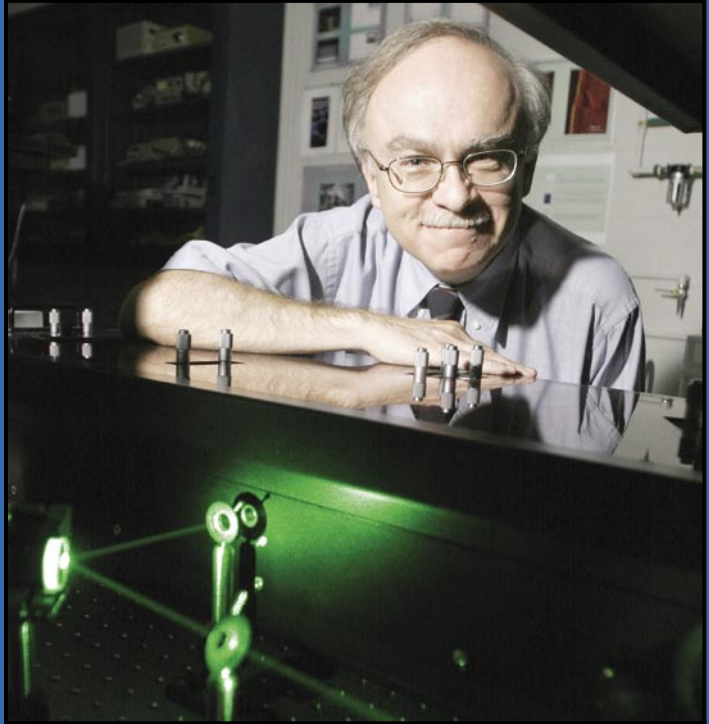


## Photonics Innovation— Imaging Technology for Medical Analysis

**Dr. Romain Maciejko of École Polytechnique de Montréal is developing a rapid, non-invasive and cost-effective imaging technology that promises to improve detection of a wide variety of diseases, including cancer and heart disease**

*“The new photonics services offered by CMC are extremely valuable for researchers. We are often very limited by what we can do within a university. Manufacturing original prototypes directly through industrial fabrication facilities is very expensive and you often have to alter your devices to match their processes. CMC’s partnership with the Canadian Photonics Fabrication Centre provides researchers with access to state-of-the-art photonics fabrication. A working device increases the opportunity to commercialize research in the future.”*

**Dr. Romain Maciejko  
Professor  
Engineering Physics  
École Polytechnique de Montréal**

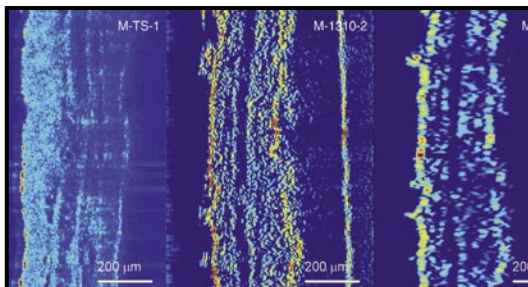


Dr. Maciejko, École Polytechnique de Montréal, is working with CMC to fabricate a compact device that will substantially improve the resolution of images produced by today’s X-rays and ultrasounds.

**C**MC Microsystems is making it possible for Professor Romain Maciejko of École Polytechnique de Montréal to develop a new type of high-performance and high-resolution optical imaging system that out-performs X-rays and ultrasounds in specific applications.

Dr. Maciejko is taking advantage of new photonics products and services offered by CMC Microsystems. A partnership between CMC and NRC’s Canadian Photonics Fabrication Centre (CPFC) enables university researchers to access the industry-grade photonics fabrication services offered by this facility.

The Ottawa-based CPFC is currently finalizing the prototype developed by Professor Maciejko—for a broadband optical source that will help optical coherence tomography (OCT) to produce high-resolution, real-time, three-dimensional images of biological tissue.



Images of mouse tissue: optical coherence tomography (OCT) technology produced the high resolution image on the left, while a commercial supraluminescent diode produced the image on the right.

OCT is a new optical technology used in a growing number of medical fields, including dermatology, dentistry, gynecology, oncology and cardiology. Professor Maciejko is seeking to increase the resolution and overall performance of these imaging devices by at least one order of magnitude.

“The higher the resolution, the greater the opportunity to detect disease in tissue,” he explains. “The research challenge has been to develop a cost-effective way to increase the resolution, while reducing the size of the components. We are aiming to package this technology into the size of a small suitcase, allowing it to be used easily in a hospital setting.”

There are many potential applications for this technology—including the early detection of heart disease. Dr. Maciejko is working in collaboration with the Montreal Heart Institute and the National Research Council’s Industrial Materials Institute on the project.

This fall, he expects to receive a three-year research grant to demonstrate a working system, using the prototype manufactured through CMC. One of the industry partners will be a Canadian company seeking to further develop and potentially commercialize the technology. *cmc*