Centre for Imaging Research and Advanced Materials Characterization

The Centre specializes in the development of new high frequency acoustic and acousto-optic imaging systems and conducts research in advanced principles and methods for the imaging and quantitative characterization of surface, sub-surface and bulk materials structures.

Left to Right: *Back Row:* Dr. Fedar Severin, Alex Denisov, Andrew Chertrov, Dr. Kyung Cho Kim. *Middle Row:* Inna Severin, Brian O'Neill, Dr. Roman Maev, Dr. Elena Maeva, Jeff Sadler. *Front Row:* Sarah Beneteau, Emily Schmidt, Wesley Arthur

The Staff

The staff includes researchers with broad international experience in acoustic and acousto-optic imaging and advanced materials characterization. The Windsor Centre is known internationally and works in cooperation with various institutions in Canada, the USA, Germany, France, Italy, Russia, China and Japan, specializing in imaging research and applied solid state physics and engages in international collaborative projects.

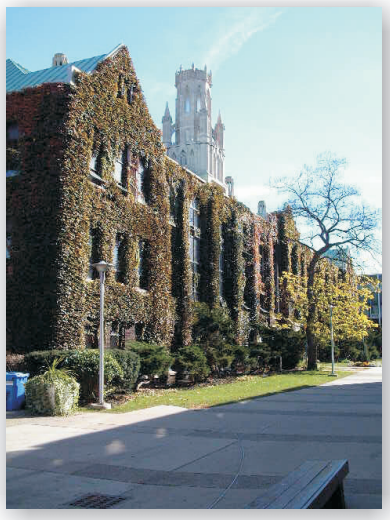
Dr. Roman Gr. Maev, Professor, Director

The Goals

- Generation of new knowledge in the science of quantitative non-destructive evaluation of various materials using principles of applied physics, physical acoustics, acousto-optics and solid state physics.
- Application of new knowledge to the development of commercial NDE procedures and "smart" equipment for rapid and accurate materials characterization.
- Education and development of highly qualified specialists in advanced materials characterization and imaging research, notably, in quantitative NDE technologies based on advanced imaging techniques.
- Creation and presentation of training programs in quantitative NDE technologies for advanced imaging procedures.
- Facilitation of international cooperation in NDE technologies for advanced materials characterization, through collaborative research, technology transfer and development of international standards

The Activities

The IRAMC Centre is engaged in research and development of advanced systems and methods in the following areas:



- acoustic microscopy;
- high-resolution nondestructive evaluation;
- ultrasonic sensors;
- non-linear acoustics;
- array transducers;
- acousto-optics.

We also develop hardware and software for image processing and high-speed 2D and 3D data visualization and analysis.

The mission of the IRAMC Centre is to provide fundamental research and to develop novel state-of-the-art research systems and methods in the area of applied solid state physics and advanced material characterization. We also focus our attention on applications of nondestructive testing technology for solving crucial quality-control problems during the manufacturing process.

Objectives of the IRAMC Centre are to become a recognized leader in the field of investigation and development of a new generation of ultrasonic and acousto-optical systems and methods, as well as participate in the development of new, quality inspection and process control systems for a wide range of industrial applications.

We participate in student and researcher exchange programs with other universities, including: Johns Hopkins University, the University of Michigan, and the Russian Academy of Sciences.

Industrial Relations

The objectives of the IRAMC Centre have been jointly formulated by its founding partners: DaimlerChrysler and University of Windsor. The Centre Partnership Initiative combines the theoretical knowledge of university researchers with the practical focus of company engineers to expand the boundaries in a number of advanced scientific, engineering and manufacturing technologies.

Other potential industrial partners include those in the field of aircraft manufacturing, oil and gas pipe inspection, power station machinery, and railway transportation inspection. In addition, our Centre is involved in projects for advanced material and medical research and acoustic imaging diagnostics.