

Nano-scale science of technology-relevant materials



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The laboratory is one of the best equipped multi-mission laboratories in Canada with a wide range of *state-of-the-art* facilities (ESCA, SEM, time-resolved FTIR, LEED/AES, EELS, numerous UHV equipment, and one-of-a-kind spectrometers and tools) for a wide range of projects in several important research areas:

- Materials research: semiconductor surface science and biomolecular engineering;
- Atomic and molecular sciences: plasma and atmospheric processes;
- Chemical physics: electron-matter interactions and coincidence spectroscopies;
- Synchrotron radiation research: photo-breakdown phenomena

Specific projects include:*

1. In-situ radiation-induced surface phenomena — Molecular engineering of a conductive polymer-semiconductor interface for *nano*-technology applications.
2. Surface electron spectroscopies — Vibrational and electronic spectroscopies of biomolecules in new materials development.
3. Development of nano-matter and technological thin films for industrial applications, using ESCA, SEM and FTIR as the probes.
4. Molecular orbital imaging — (e,2e) spectroscopy of large molecules, oligomers, and clusters.
5. Coplanar electron scattering — Radiation physics and cross-section measurement of environment-relevant materials.
6. Spectroscopies of radiation-induced breakdown processes — Time-of-flight ion and electron spectroscopies of technological molecules using synchrotron light and/or an electron beam.
7. Low temperature plasma physics and chemistry — Applications to materials processing.

* For reference, see the 1997 Noranda Award Lecture, in *Canadian Journal of Chemistry* 75, 1295-1309 (1997). See also: *Physics in Canada*, Sept/Oct 1999.

Breaking News! A new multi-million dollar materials research facility has been awarded to the University of Waterloo by Canada Foundation for Innovation. Scheduled to be operational by August 2000, this world-class facility will open up new exciting R&D opportunities (including both graduate and undergraduate research studentships) and shape the future of materials research in Canada in the decade to come. For more up-to-date information, see

<http://leung.uwaterloo.ca>