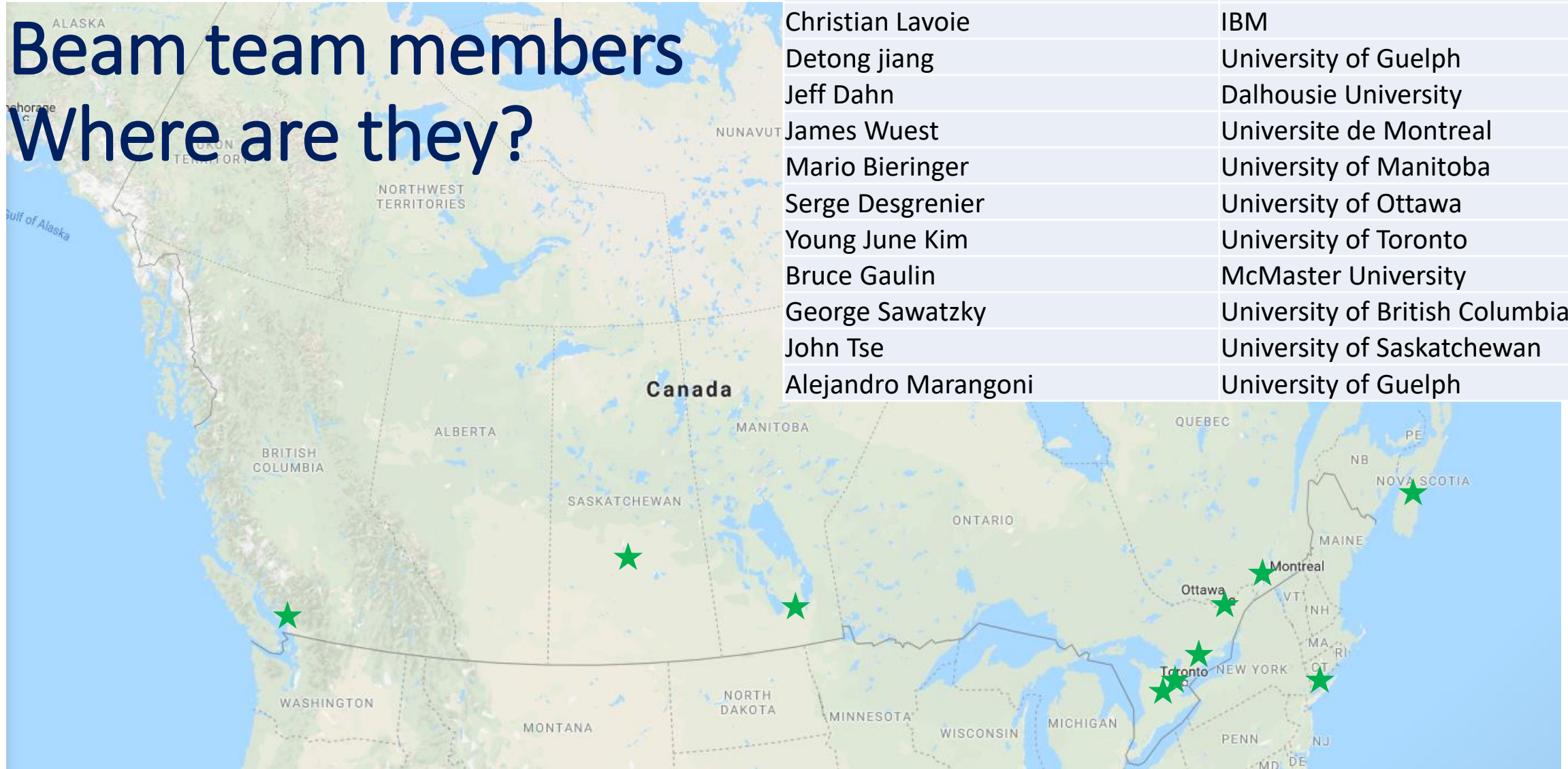


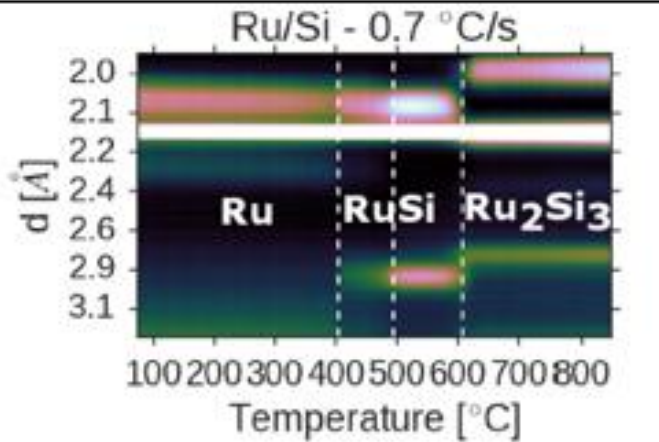
Brockhouse

Beam team members Where are they?

Name	Location
Stefan Kycia (beam team leader)	University of Guelph
Christian Lavoie	IBM
Detong jiang	University of Guelph
Jeff Dahn	Dalhousie University
James Wuest	Universite de Montreal
Mario Bieringer	University of Manitoba
Serge Desgrenier	University of Ottawa
Young June Kim	University of Toronto
Bruce Gaulin	McMaster University
George Sawatzky	University of British Columbia
John Tse	University of Saskatchewan
Alejandro Marangoni	University of Guelph



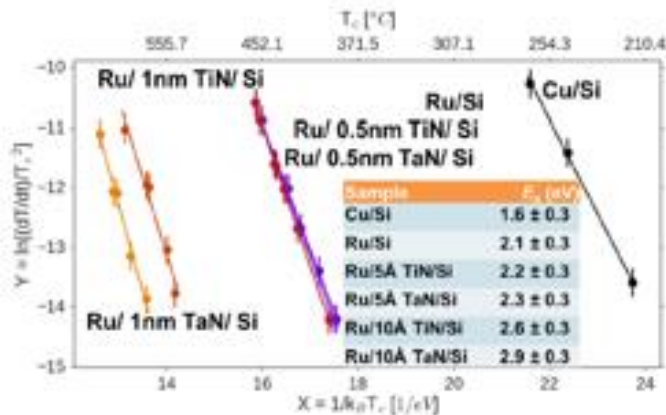
SOE1 – In-situ diffraction



Christian Lavoie's research aims to optimize materials and processes for CMOS technologies:

- ✓ Design, fabrication and test of CMOS structures for optimization of contacts to future devices.
- ✓ Responsible for the design, upgrades and supervision of unique time resolved in situ characterization facility in BNL and now at the CLS.
- ✓ Christian is a co-author of more than 200 publications and a co-inventor on more than 150 patents.

Christian Lavoie - IBM

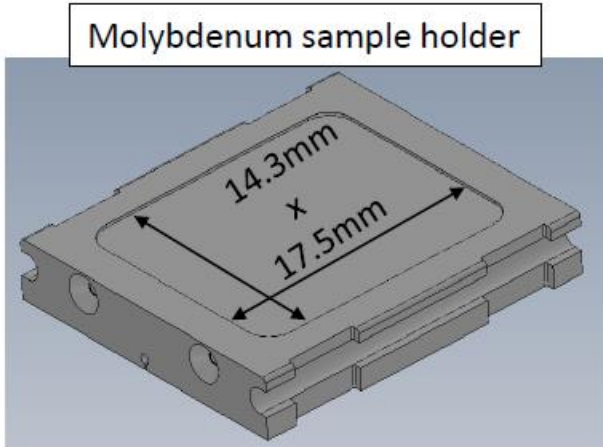
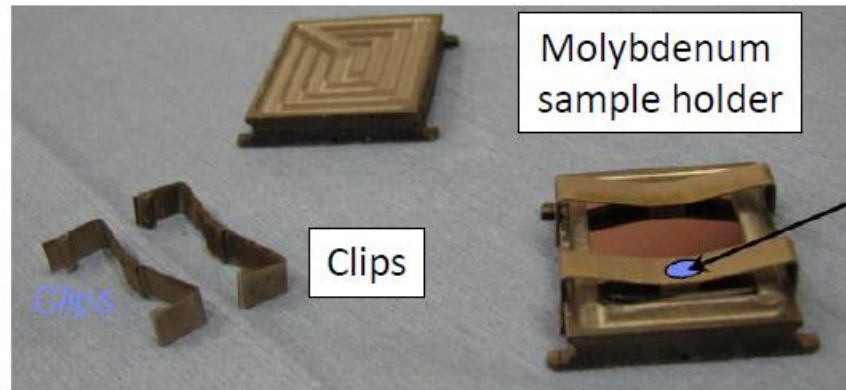
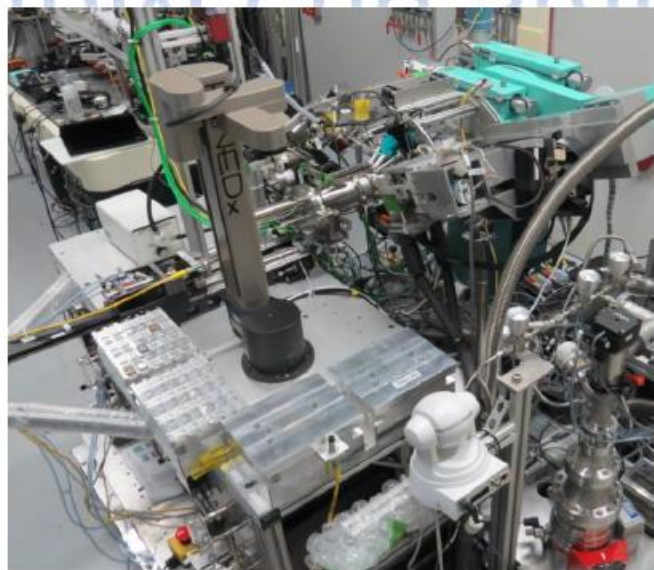


J. Vac. Sci. Technol. A, Vol. 35, No. 3, May/Jun 2017

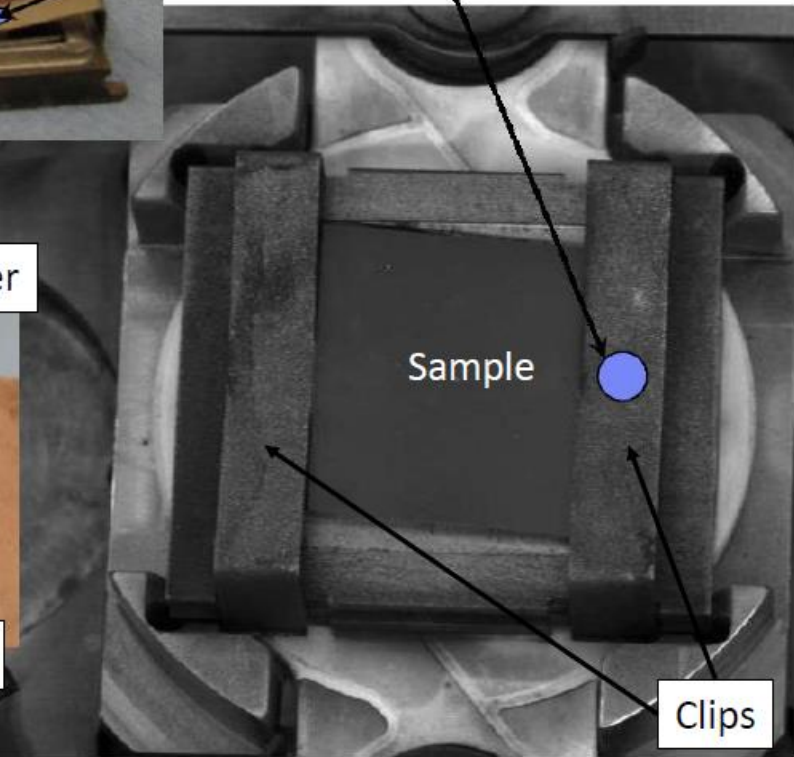
IBM end-station

Thin films studies

Combined diffraction, resistivity and roughness measurements under ultra high purity N₂ or He. Temperature up to 1100 °C.



Sample size should be approximately 12mm x 15 mm



Currently operating on a bending magnet at the IDEAS beamline. Will be moved to the LE wiggler beamline.

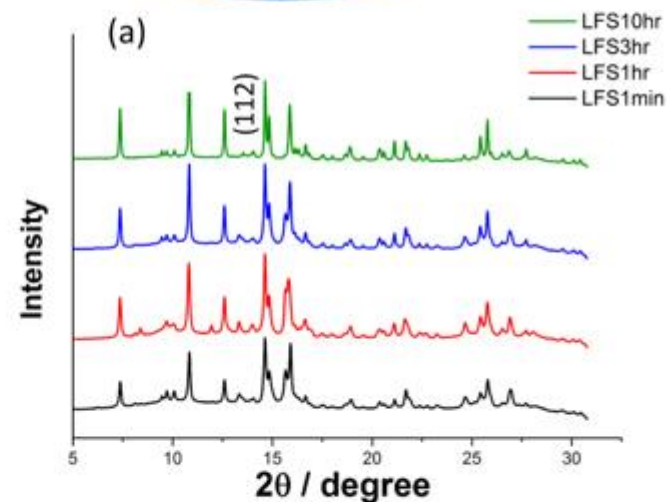
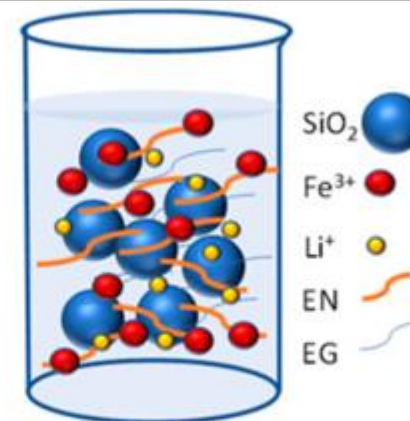
SOE1 – *In-situ* diffraction



De-Tong Jiang
Associate Professor
University of Guelph

- ✓ Growth and structural property of organic semiconductor films;
- ✓ Structural properties of nickel silicide thin films;
- ✓ Arsenic and copper speciation in environmental systems;
- ✓ *In situ* characterization of lithium metal silicate batteries.

Common theme: applying a multitude of synchrotron radiation based techniques to probe the atomic/molecular structures for understanding the structure-function relationships



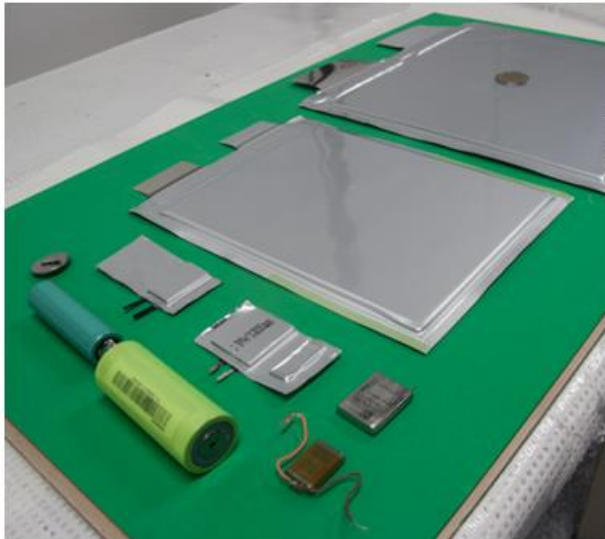
Mesoporous nanostructured
 $\text{Li}_2\text{Fe(II)SiO}_4$

ACS Sustainable Chem. Eng. 2018, 6, 7458–7467

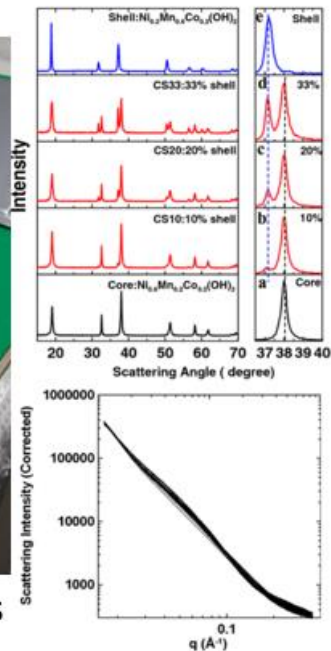


SOE1 & 3 – Combinatorial material science

Professor Jeff Dahn, Dalhousie University
Canada Research Chair, NSERC/Tesla Canada
Industrial Research Chair



Li-ion cells of all shapes and sizes



Jeff Dahn's research focuses on the Physics and Chemistry of materials for energy storage. He is recognized as one of the pioneering developers of the lithium-ion battery that is now used worldwide in laptop computers and cell-phones. He is the Canadian leader in Combinatorial and High Throughput Materials Science.

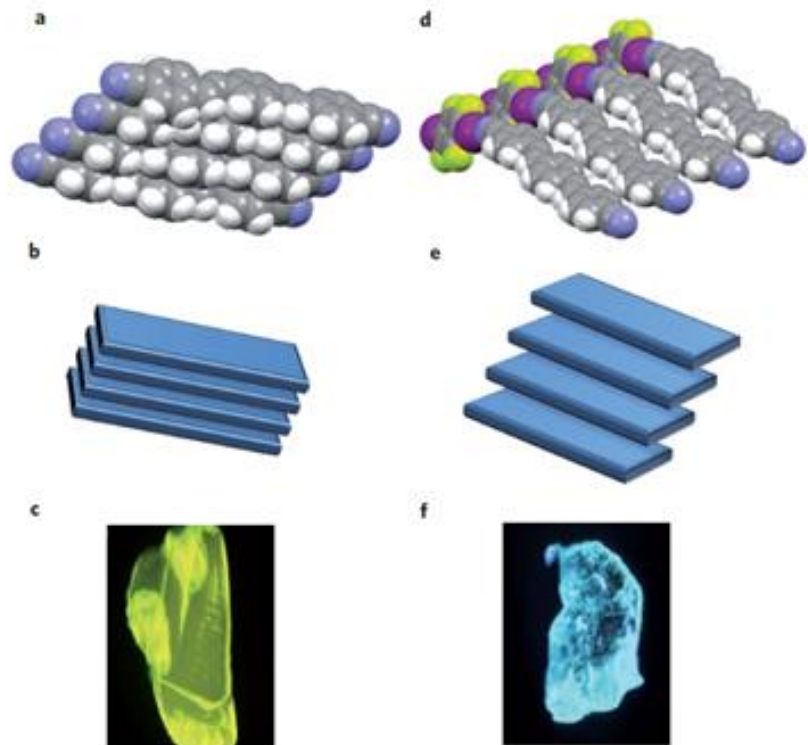
Journal of The Electrochemical Society, **163** (14) A2841-A2848 (2016)



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SOE1 – Single crystal crystallography



NATURE CHEMISTRY | VOL 4 74 2012 |

James Wuest is interested in the design and synthesis of new molecules. His research touches on various aspects of chemistry such as organic, organometallic and inorganic chemistry. One of its main objectives is to understand and exploit the molecular association induced by weak interactions.



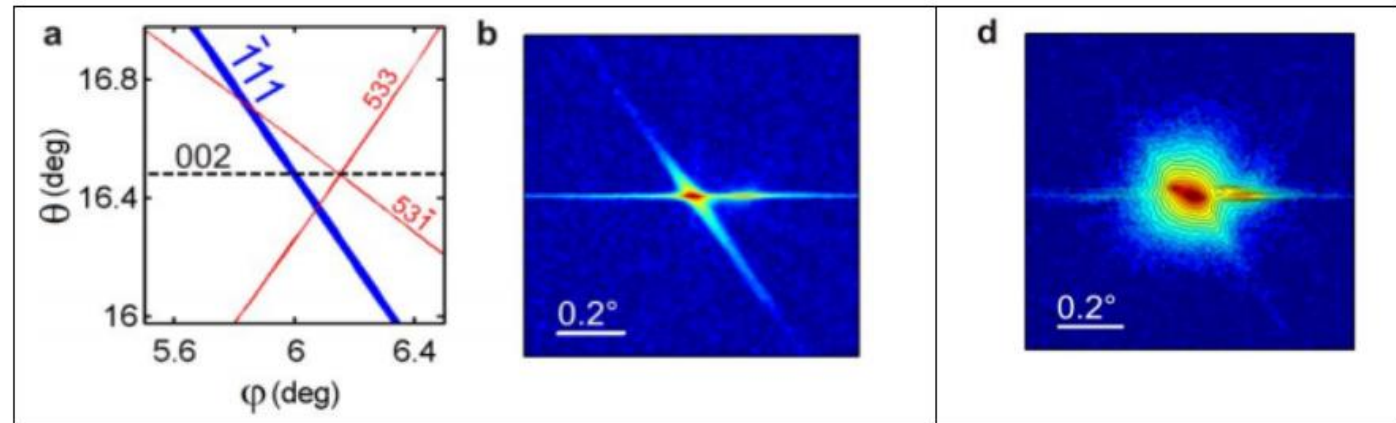
James D. Wuest - Full Professor
Canada Research Chair in
Supramolecular Materials

SOE2&3 – Pair distribution function and single crystal

Professor Stefan Kycia
University of Guelph



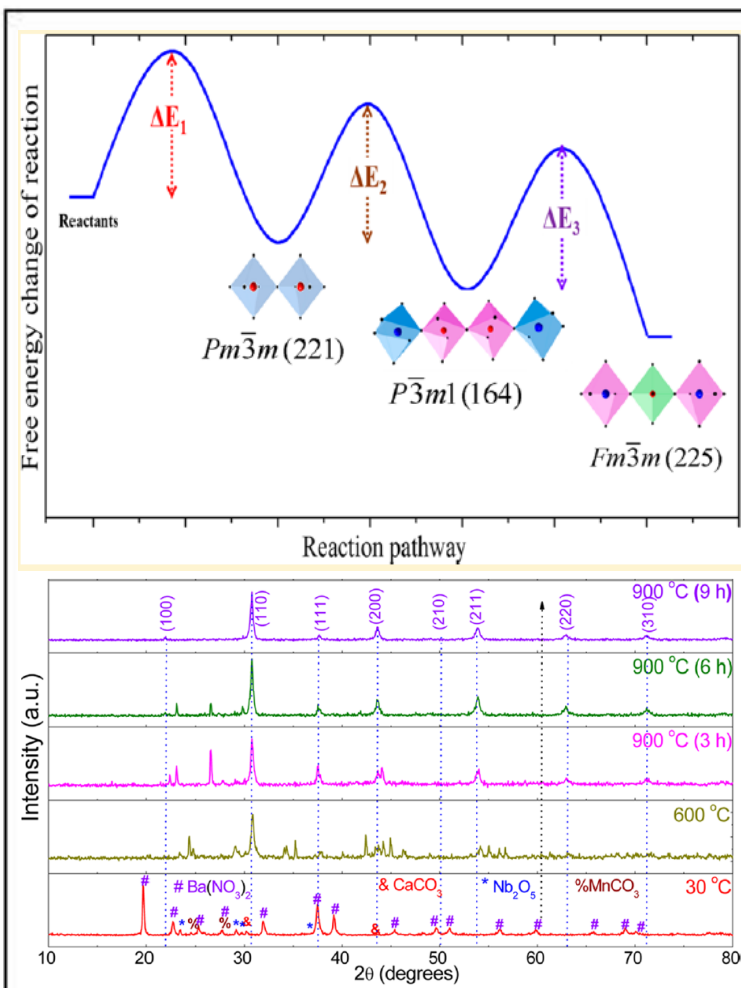
Stefan Kycia is the principal investigator of the Brockhouse project at the Canadian Light Source. His research intends to resolve fine details of the atomic structure nanoparticles and nano-sized structures. He employs and develops x-ray diffraction methods for the structural characterization of novel materials.



2nd order diffraction in plastically deformed silicon



SOE1 – High resolution powder diffraction



Dr. Mario Bieringer
Associate Professor
McMaster University

His research focuses on the preparation of novel inorganic solids and the investigation of their physical properties to establish structure - property relationships. The materials of concern belong to the groups of transition metal oxides, lanthanide oxides and metal oxychlorides.



Inorg. Chem. 2014, 53, 19, 10085-10093

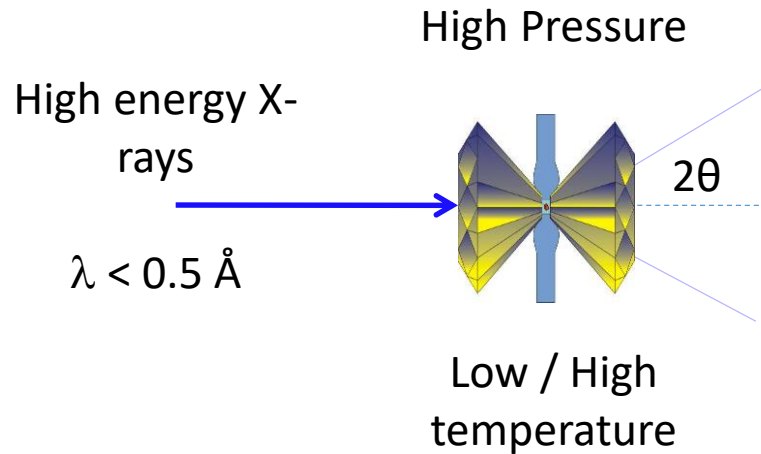


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synchrotron

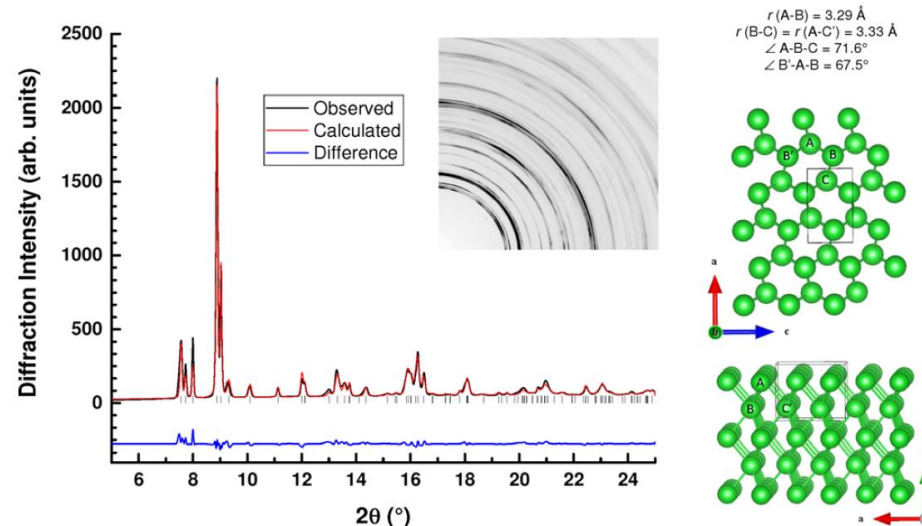
SOE2 – High pressure station

Materials at Extreme Conditions

Professor Serge Desgreniers
University of Ottawa



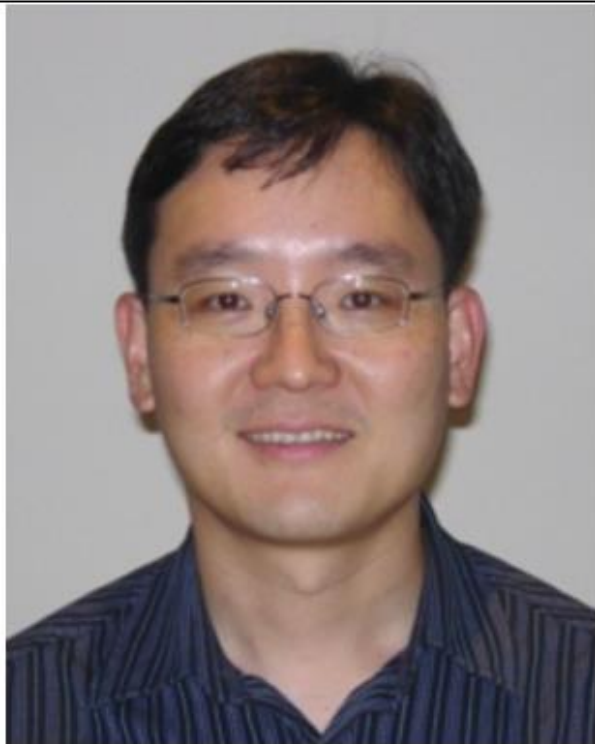
Our research objectives are the measurements and understanding of the physical properties of dense materials, the synthesis and study of novel materials and the development of methods to probe condensed matter at extreme conditions using synchrotron radiation.



Canadian Light Source
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Appl. Phys. Lett. **107**, 221908 (2015)

SOE3 – Reciprocal space mapping and resonant scattering

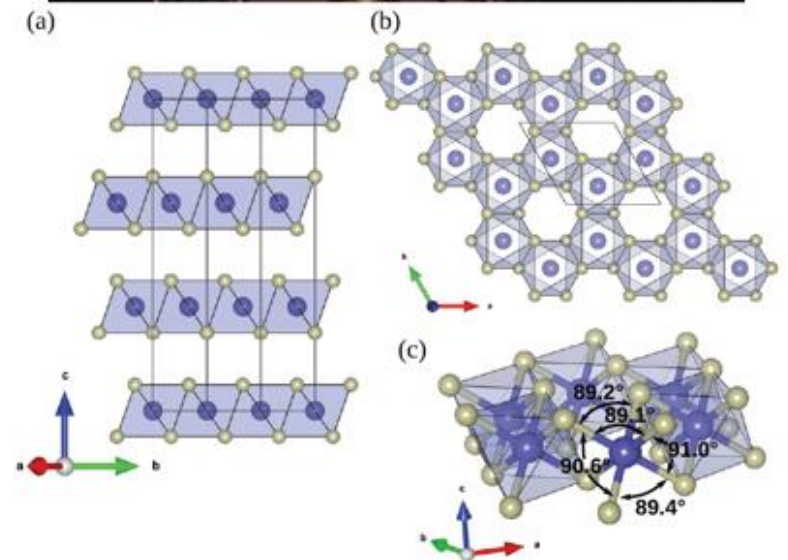


Young June Kim –
Professor at University of
Toronto

Research Interests:

- ✓ High temperature superconductors
- ✓ Topological quantum phases in iridates
- ✓ Thermoelectric materials
- ✓ Structure of exfoliated thin nanocrystals
- ✓ Quantum magnetism in nanostructures

Materials synthesis is an important aspect of his research. His group grows large high-quality single crystals for neutron scattering experiments. Also, they search for materials with novel properties, such as superconductivity and highly efficient thermoelectrics.



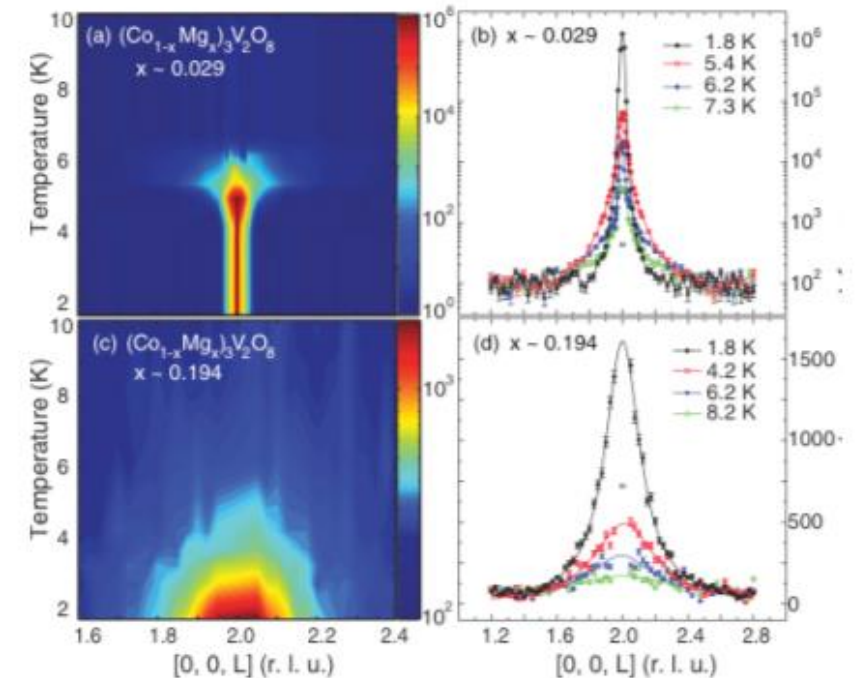
PHYSICAL REVIEW B **90**, 041112(R) (2014)

SOE3 – Reciprocal space mapping and resonant scattering



Professor Bruce Gaulin
McMaster University

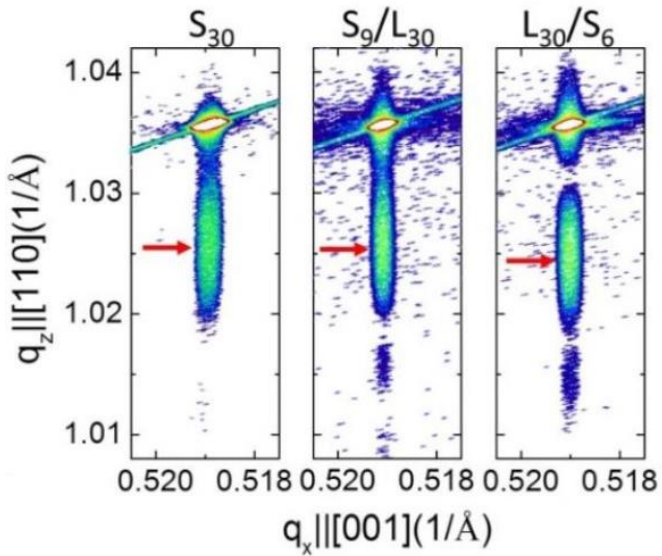
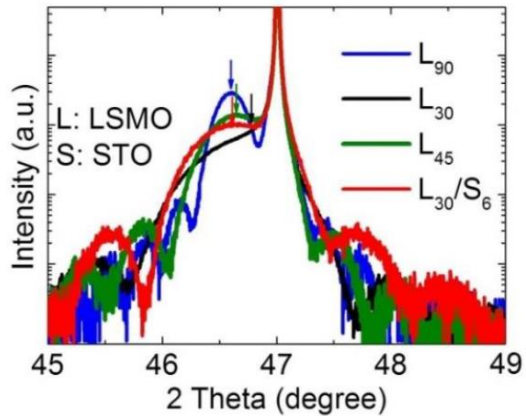
His research involves the growth and structural characterization of novel magnetic materials. He is a frequent user of neutron facilities worldwide, applying extreme low temperatures and high magnetic fields to investigate frustrated magnets, quantum magnets and high temperature superconductors.



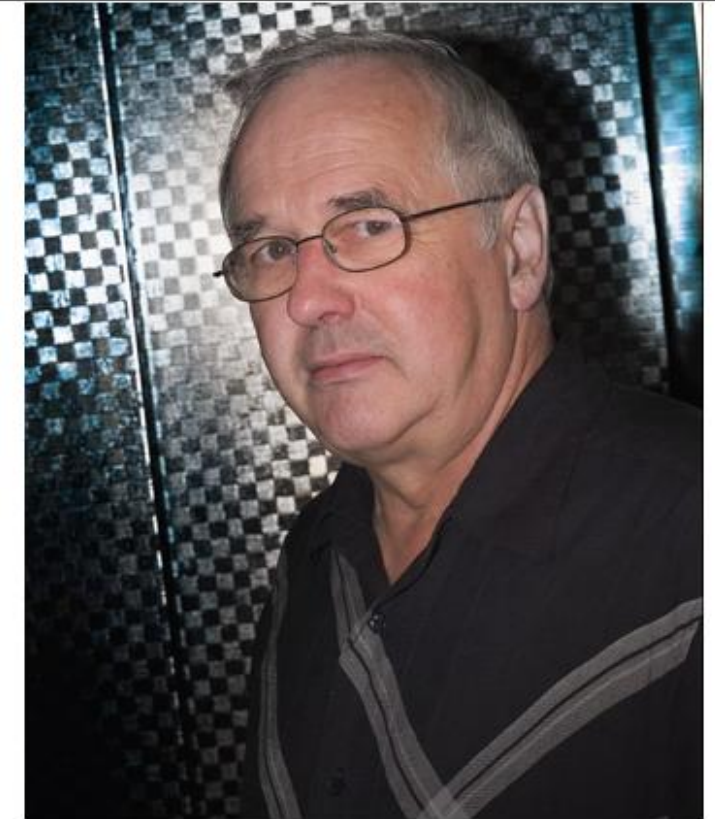
PHYSICAL REVIEW B 86, 174421 (2012)



SOE3 – Single crystal diffraction and Resonant Scattering



George Sawatzky broad research program involves the fabrication, the theoretical and spectroscopic study of novel complex systems and nanostructured materials. The goal is to develop new approaches and understanding in the quantum theory of solids and define new pathways for the fabrication of materials and structures with innovative physical properties. Sawatzky has made major contributions to the understanding of transition metal oxides and more generally correlated electron systems and also to the development of spectroscopic techniques suited to study the electronic structure of these systems.



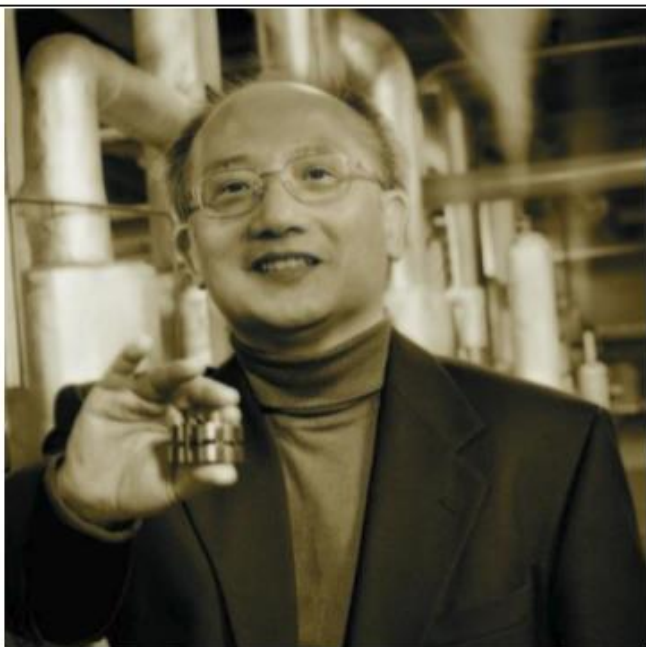
Professor George Sawatzky
University of British Columbia

Adv. Funct. Mater. 2017, 27, 1606717



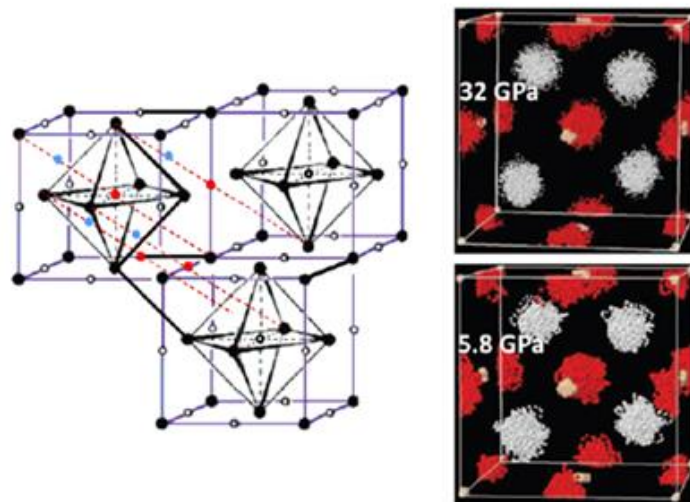
Canadian Light Source
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SOE2&3 – High pressure and inelastic scattering



Professor John Tse, University of Saskatchewan,
Canada Research Chair in Materials Science

PRL **105**, 215501 (2010)



John Tse uses state-of-the-art synchrotron, neutron and theoretical techniques combined with supercomputer modelling to explore the nature of matter, aiming the rational design of novel materials. His research includes energy efficient materials, semiconductors and superconductors, and development of high-resolution techniques with synchrotron radiation

SOE3 - SAXS / WAXS End-Station

Alejandro G. Marangoni, Ph.D., FRSC, FAOCS, FRSC (U.K.)

Professor and Canada Research Chair

Food, Health and Aging

