



**McMaster University  
Brockhouse Institute for Materials Research**

**Seminar Series**

**SPEAKER:** Prof Gianluigi Botton, *Dept of Materials Science and Engineering, Canadian Centre for Electron Microscopy-BIMR*  
McMaster University

**TOPIC:** From Atoms and Bonds to Colours: What Can We “See”  
with an Electron Microscope?

**DATE:** Monday January 13, 2014

**TIME:** 3:30pm

**LOCATION:** BSB 104

Electron microscopes have become very power tools to study the structure of materials at unprecedented resolution. However, microscopes provide much more than *pictures*. At the CCEM, we are fortunate to house some of the most advanced electron microscopes giving us the opportunity to explore new phenomena at the very small scale. In this presentation, I will describe the major breakthroughs in the field of electron microscopy of the last few decades, how these are implemented in the CCEM infrastructure and show that, in addition to images, microscopes can provide so much more.

I will highlight this with several examples related to the analysis of nanoscale materials, demonstrating that we can study where atoms in a solid, or in a defect, are with exceptional precision, chemical sensitivity and accuracy. I will also show how chemical bonds can be probed and how, with powerful spectroscopic techniques, we can even investigate the visible and infrared part of the electromagnetic spectrum. Many examples used in this presentation relate to strongly correlated oxides, plasmonic nanostructures, semiconductor materials and interfaces.

**BIMR Website:** <http://www.brockhouse.mcmaster.ca/news-events.html>