



SEMINAR

Analytical Electron Microscopy of Complex Engineering Materials

Professor Gianluigi Botton

Department of Materials Science and Engineering
Brockhouse Institute for Materials Research
McMaster University, Ontario, Canada

Tuesday March 4, 2008, 11.00 a.m. – 12 noon
Science Lecture Theatre S11, Bldg 25

Abstract

Electron microscopy is an invaluable tool to study the detailed structure of materials. Many of the analytical methods available in the transmission electron microscope provide detailed compositional and spectroscopic information with unprecedented spatial resolution.

Various examples of applications of electron microscopy will be given in this presentation. After an overview of the methods, the presentation will discuss detailed studies of the phase stability and phase transformations in core-shell alloy nanoparticles at high temperatures. Subsequently, electron microscopy analysis of compositional modulations and strain analysis in InAs quantum wires grown on InGaAlAs/InP will be presented. Results demonstrate quantitative mapping of indium with of individual nanowires and the detailed analysis of strain around these nanoscale structures. Additional examples will highlight the application of microscopy technique to the analysis valence state of materials used in fuel cell applications, multiferroic materials based on the perovskite structures, and the study of ultrahard coatings in tools used for machining of metals. These examples demonstrate that compositional and chemical state (valence and coordination) information can be obtained with sub-nm resolution on a broad range of materials.

Convenor: Dr. Joanne Etheridge

Email: joanne.etheridge@mcem.monash.edu.au

Visitors are most welcome: Please note that there is a designated Visitors Car Park (N1) clearly ground-marked by white paint and tickets, at a cost of \$1.4/hour for up to 3 hours, available from a dispensing machine. This high-rise carpark is located on the following Clayton Campus Map, Ref. B2.

[Printable version of the Clayton campus map \(pdf 833 kb\)](#) (Please right click to open link)