



SEMINAR

The Kinematic Convergent Beam Method

Professor John Spence

**Department of Physics, Arizona State University
And
Lawrence Berkeley National Laboratory**

Wednesday 27 May, 2009
11am – 12 noon
Science Lecture Theatre S9, Bldg 25

Abstract

The host of new nanostructures being synthesised for applications from photocatalysis of water to batteries and catalysts has created an urgent need for a method capable of determining the three-dimensional atomic structure of individual nanocrystals, which may not be layer structures. Ideally a 3D potential map should be obtainable after rapid analysis at the electron microscope. In 1976, Peter Goodman measured the low order structure factor of graphite by CBED. We aim to extend this to tomographic diffraction data which we phase by the charge-flipping method in view of its suitability for low quality data (no space-group or composition information is needed). Kinematic CBED allows absolute intensity measurement (since the (000) beam can be recorded), provides an in-built test for multiple-scattering artifacts, and may be the method of choice for crystals too small for analysis by the precession method since it uses the smallest possible probe size. I will discuss our test results on Spinel. (McKeown and Spence, J. Appl Phys. In press. Also Wu, Spence et al Nature Mat. 5, 647 (2006)).

If time allows, a brief summary of our work on femtosecond X-ray laser diffraction from proteins will also be given. This is based on the idea that a sufficiently short and intense X-ray pulse will terminate before radiation damage starts, but provide a useful diffraction pattern. Experiments start at LCLS in December.

Convenor: Dr. Laure Bourgeois

Email: laure.bourgeois@mce.m.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.

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