



## SEMINAR

### Precession electron diffraction – A useful technique or are we just going round in circles?

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Monday 30 March, 2009  
11am – 12 noon  
Science Lecture Theatre S2, Bldg 25

### Abstract

Although precession diffraction was first demonstrated with x-rays by Buerger in 1937, it took another 56 years before the analogous method was developed for electrons. In precession electron diffraction the beam, typically focused to a small spot, is rocked in a hollow conical fashion above the specimen and then de-rocked below to bring the beam back onto the optic axis. The resulting diffraction pattern has the same basic geometry as any other electron diffraction pattern but the rocking motion enables many more reflections to be intercepted by the Ewald sphere and results in a larger number of reflections being visible in the diffraction pattern than would be the case for a stationary beam. In addition, each reflection is now a single uniform disc (unlike conventional CBED for example), whose intensity is proportional to the diffracted intensity of that reflection integrated through the Bragg condition. Lastly, because the beam is never parallel to the zone axis, diffracted intensities in 'zone axis' patterns appear to be less susceptible to dynamical effects. In this talk I will attempt to answer the question posed in the title and demonstrate that precession electron diffraction is indeed a useful technique for solving crystal structures. I will discuss how and when precession diffraction intensities may be considered sufficiently 'kinematical' for use with structure solution algorithms, and show a number of examples from past and present of successful (and failed!) structure solutions. A brief look to the future will consider the benefits of aberration-corrected precession.

Convenor: Dr. Joanne Etheridge

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