



**08<sup>th</sup> November 2011 - 14:15**  
DESY building 28c (FLASH hall) - seminar room

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## Ptychography

After a brief review of the history of ptychography, I report some recent advances in the technique which we have developed at the University of Sheffield over the last few years.

Although ptychography was originally regarded as a way of improving resolution in short (atomic scale) imaging, its phase sensitivity has some important applications at visible light wavelengths (where lenses can be near perfect): e.g. in surface metrology, contact lens metrology and high-contrast biological imaging. We have also used the optical bench to enhance the technique, with a view to applying new methods at X-ray and electron wavelengths. The use of a diffuser reduces the required dynamic range of the detector and the resulting redundancy in the measured data can allow us to calculate large areas of the diffraction pattern which fall outside the detector itself (i.e. which have not actually been measured). I will also discuss 3D scattering effects and post-acquisition probe position inference.

Electron ptychography has proved to be much more difficult than originally envisaged (although this was a key motivation for its development): recent results will be presented.

Host: Henry Chapman, CFEL, Coherent Imaging Division