



## SEMINAR

# Annular bright field scanning transmission electron microscopy imaging dynamics

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11.00am – 12 noon  
Science Lecture Theatre S2, Building 25

### Abstract

An annular detector within the bright field region in atomic resolution scanning transmission electron microscopy (STEM) has recently been shown to produce images showing both light and heavy element columns simultaneously. This technique has been called annular bright field (ABF) imaging, by analogy to annular dark field (ADF) imaging. These ABF images robustly allow the simultaneous imaging of light and heavy columns at atomic resolution over a wide range of thicknesses. We show how a combination of the interference behaviour of tightly bound column states and the role of absorption due to thermal scattering can be used to explain the form and robustness of the ABF images. Simulations exploring the imaging dynamics more fully will also be presented, including issues like optimum aperture sizes and the effect of inter-column spacing and structural distortion. The prospect for direct imaging of lithium using the new technique is discussed. A combination of ABF and ADF imaging is used to gain some insight into grain boundary structure.

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