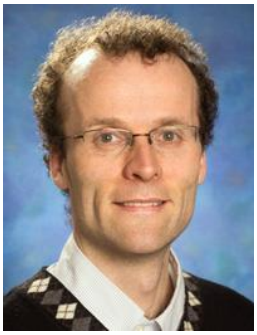
東京大学
微細構造解析
プラットフォーム
The University of Tokyo

東京大学微細構造解析プラットフォーム
公開講演会

“Explorations in quantitative scanning transmission electron microscopy”



Prof. Scott D. Findlay

School of Physics and Astronomy,
Monash University, Victoria, Australia

High resolution scanning transmission electron microscopy (STEM) offers many different imaging modes. For example, high-angle annular dark field images are highly sensitive to atomic number, annular bright field images allow light and heavy element columns to be visualised simultaneously, and spectroscopic imaging modes allow for mapping the distribution of different elements. While qualitative interpretation of STEM images has enabled good science and structure analysis, there is a growing appreciation that yet more information can be deduced if the STEM signal can be analysed quantitatively. This talk will overview four areas where quantitative analysis is producing new insights.

1. The long-established technique of energy dispersive X-ray (EDX) spectroscopy has only recently become possible at atomic resolution. Proof-of-principle experimental data are shown exploring the prospect for reproducing in the atomic resolution regime the success in composition determination that STEM EDX has long enjoyed at lower resolutions.
2. Recent developments in segmented and pixel detectors have enabled us to better measure the electron scattering distribution. Using a combination of simulation and experimental data, the limitations on measuring the atomic-scale projected potential will be discussed.
3. The complexities introduced by electron scattering are not restricted to the atomic resolution regime. Using the electric field of a p-n junction as a case study, we explore some of the challenges of quantitative differential phase contrast imaging at lower resolution.
4. Position-averaged convergent beam electron diffraction is an attractive technique because, on periodic specimens, it is unaffected by coherent and incoherent aberrations in the probe-forming optics. The reliability of thickness determination using this technique will be explored.

Jun 6 (Tue), 2017 15:30～17:00
Main meeting room at Institute of Engineering Innovation, UT
(工学部総合研究機構　9 号館 1 階　大会議室)
Organizer: Prof. Naoya Shibata, Prof. Yuichi Ikuhara
Phone: 03-5841-7688