

## SEMINAR

### “Applications of the Quanta 3D FEG in biological imaging”

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Friday 2 September, 2011  
11am – 12noon  
Science Lecture Theatre S11, Building 25

#### Abstract

The NanoVision Centre is a multidisciplinary microscopy suite providing physical science microscopy techniques to the whole College. Our Quanta 3D FEG instrument is configured for maximum flexibility in sample environment, allowing for the usual applications in materials science and some new capabilities in biological imaging. Examples of some of the more unusual applications of this instrument will be presented here. Volume Electron Microscopy (FIB-SEM tomography) can overcome the volume versus resolution dilemma in biological imaging to reveal complex 3D structural detail throughout volumes of many tens of thousands of cubic micrometres of tissue, particularly where site-specific information is required. The inclusion of a cryo-stage can provide an additional capability for simple in-situ dissection of biological samples. Making use of the low vacuum capability of the Quanta, an in situ AFM system allows nanomechanics tests to be performed on structures that are not resolvable in an optical system, such as fibre pull-out tests in mineralised tissues.

*Dr Andy Bushby gained his PhD at QMUL on the fracture mechanics of fibre cement composites. This was followed by post-doctoral work on the mechanical behaviour of structural ceramics including fatigue and creep at 1400°C. Further post-doctoral work at the University of Sydney focused on the deformation and fracture behaviour of ceramics using advanced microscopy techniques and introduced him to the emerging technology of nanoindentation testing. Returning to QMUL in 1995 he established the nano-mechanics laboratory and became involved with the development of international standards for nanoindentation. His research in recent years has concentrated on the deformation behaviour of materials at small length scales and ranges from the fundamental physics of deformation to the micro-mechanics of biological tissue. In 2007 he created The NanoVision Centre at QMUL for advanced microscopy introducing the latest in scanning electron microscopy techniques and is now director of the Centre*

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