



# THE UNIVERSITY *of* EDINBURGH

## School of Engineering

### IMP industrial seminar

13:00-14:00 on **21<sup>st</sup> Nov**

**Swann Building 7.15**



**X-Ray Microscopy: an introduction into sub-micron non-destructive imaging and multiscale workflows**

### ABSTRACT

Sub-micron, non-destructive imaging is a vital tool for a wide range of materials research-based applications. X-Ray micro computed tomography is a technique which can allow for sub-micron imaging of samples in a non-destructive manner. The architecture of standard, commercially available  $\mu$ CT instruments, limits imaging resolution due to constraints of sample size and working distance.

ZEISS X-Ray Microscopes use a unique and patented instrument architecture which provides sub-micron imaging capabilities at working distances and sample sizes that are much larger than would be achievable on these conventional systems. X-Ray microscopy also allows for further techniques such as diffraction contrast tomography, otherwise only achievable on certain synchrotron beamlines. Proprietary advanced reconstruction methods of CT data using machine learning has also created a paradigm shift in what is possible on laboratory-based tools with significant improvements on throughput and image quality.

This combination of unique instrument architecture and advanced software allows for X-Ray microscopy to create significantly higher impact research compared to traditional CT methods in any research field where the traditional methods have been used.

Further work has been performed to correlate X-Ray Data to higher resolution, destructive techniques such as focused ion beam scanning electron microscopy and femtosecond laser ablation methods.

### SPEAKER

Mark Parsons is the UK sector lead for Materials Research at ZEISS UK and has worked at ZEISS for 8 years as an applications specialist. Mark holds a Master's degree in Chemistry from the University of Central Lancashire with his research at university focusing on solid state synthesis and characterisation methods such as X-Ray Diffraction and crystallographic structural refinement. Within ZEISS UK Mark is a leading specialist in X-Ray Microscopy and Focused Ion beam electron microscopy as well as correlative techniques between these modalities.

