

Seminar

Novel applications of advanced electron microscopy techniques in materials failure analysis

 Thursday January 28, 2021	Dr Ali Gholinia Ali Gholinia is a senior Research Fellow working in the Electron Microscopy Centre, University of Manchester in UK.
 7:00pm (AEDT)	
 ZOOM – https://monash.zoom.us/j/84234702802?pwd=UFRsVkJxbW9TZEZlZTF3Vk5LNURaQT09 PASSCODE: 123456	

Abstract

How do materials fail? How can we design materials to prevent failure and prolong component life? These are the type of questions that not only have significant scientific interest but also have great implications for engineers and economic consequences. Advances in electron microscopy are enabling scientists and engineers to understand Stress Corrosion Cracking, and ultimately Failure in more detail as well as across a range of scales. Here I will illustrate through case studies how scanning electron, laser/ ion beams and 3D tomography can be used to analyse the early stages of initiation and propagation of cracks both to better understand the safe lifetime of existing materials and to look towards ways of extending the life of engineering materials and components.

Illustrative case studies will include;

1. Multiscale imaging of the competition between pitting and intergranular corrosion that leads to failure in Stainless Steel. [doi: 10.1038/srep04711](https://doi.org/10.1038/srep04711).
2. Correlative imaging to characterise defects in steel bearings, [doi: 10.1016/j.ultramic.2020.112989](https://doi.org/10.1016/j.ultramic.2020.112989).
3. Wear mechanisms and surface integrity with dry and lubricant environments, [doi: 10.1007/s11249-018-1013-2](https://doi.org/10.1007/s11249-018-1013-2).

The Presenter

Dr. Ali Gholinia is a senior Research Fellow working in the Electron Microscopy Centre, University of Manchester. He obtained his PhD from the Materials Science at the University of Manchester. After post-doctoral positions at the University of Manchester in UK and TU-Delft in the Netherlands, he worked at HKL and Oxford Instruments in Denmark to work on development of the electron backscatter diffraction (EBSD) technique and its applications, before taking up his current position in Manchester.

Convener

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