

NOMATEN HYBRID-SEMINAR

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In-person: NOMATEN seminar room

Tuesday, FEBRUARY 28th 2023 13:00 CET

Shedding Light on Localised Corrosion

Prof. Alison J. Davenport

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Abstract: Synchrotron X-rays provide ideal tools for studying the processes that control localised corrosion of metals in wet environments, which is key to understanding the processes that can cause damage to structures such as nuclear waste storage containers and aircraft. In this talk, the morphology of localised corrosion is explored with radiography and tomography, and the chemistry that control the reactions is determined with spectroscopy diffraction, providing insight into how the balance between metal dissolution and the formation of protective passive films affects the stability of localised corrosion sites.

Bio: Prof. Alison Davenport has extensive experience in the field of corrosion and materials science. She worked as a staff scientist at Brookhaven National Laboratory for eight years, during which she focused on synchrotron X-Ray techniques for studying the corrosion and passivation of alloys. In 1995, Davenport joined the University of Manchester, where she served as an Associate Editor of the Journal of the Electrochemical Society from 1995 to 1997. At the University of Birmingham, she examined the relationship between alloy microstructures and localised corrosion chemistry. Davenport developed X-Ray micro-tomography to study the growth of small cracks in metals, which helped her to understand the transition from pits to cracks in metals. She has also studied the relationship between microstructure and corrosion in stainless steel, titanium and aluminium, and has investigated the impact of grain boundary crystallography on intergranular corrosion. Davenport employs X-Ray imaging to study corrosion, and this information helps her to develop life-time prediction models. She collaborates with synchrotron facilities to develop in situ characterisation techniques to better understand the mechanisms of corrosion. Davenport currently leads an Engineering and Physical Sciences Research Council (EPSRC) consortium, which aims to develop synchrotron methods for studying nuclear waste storage. Additionally, she has served as an international consultant on nuclear waste storage. Davenport has also worked with Owen Addison to study how corrosion impacts biomedical implants.



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