

NECEM WEBINAR: "Beyond the Bulk: New Approaches to Interfaces and Ion Transport in Energy Materials"

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Ion transport is central to energy technologies. The materials exhibiting ion conduction in these technologies present stunning heterogeneity and a plethora of complicated ion diffusion mechanisms from which they often derive their functionality. This situation is further complicated when we begin to consider microstructure and interfaces. Nevertheless, it is imperative to understand these mechanisms and interfaces, and their influence on the performance of ion conductors, in order to design next-generation materials and devices, as well as improving existing technologies. In this NECEM webinar, I will present results from our recent work on solid electrolytes for solid-state batteries and solid oxide fuel cells, as well as future directions, including hybrid perovskites for photovoltaics.

Biography



Dr. James A. Dawson is a Newcastle University Academic Track Fellow in the School of Natural and Environmental Sciences. His research utilises state-of-the-art computational techniques to investigate ion transport and defects in energy materials and their interfaces. Prior to joining Newcastle University, James was a postdoctoral research associate (PDRA) in the Department of Chemistry at the University of Bath, where he carried out simulations of battery materials with a particular focus on solid electrolytes for solid-state batteries. Preceding this position, he researched materials for resistive random access memories as a PDRA at the University of Cambridge. Following his PhD at the University of Sheffield working on perovskite materials for electronics, James spent two years at the Kyoto University in Japan as a JSPS Postdoctoral Fellow working on a variety of topics, including cathodes and electrolytes for battery and solid oxide fuel cell applications.