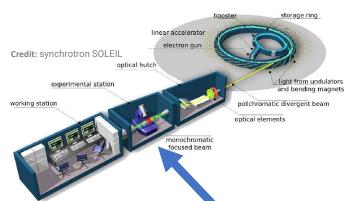
Connor Wright PhD Student



Designing a multi-modal, correlative workflow for the *operando* characterisation of Na-ion battery interfaces

- Sodium-ion batteries (NIBs) are often considered the most realistic replacement for Lithium batteries in applications such as transport and home/grid-scale storage.
- Their continued progression is being hindered by a lack of in-depth knowledge surrounding the liquid-solid interfaces.
- Combining the benefits of both synchrotron (x-ray) radiation and electron microscopy allows for new aspects of interfacial evolution and degradation to be examined.



Fluid Inlet/Outlet to Electrolyte Bridge Credit: Microsc. Microanal. 20, 1029–1037, 2014 MEMS-based Electrochemical Cell Sealed within In situ TEM Holder Transmitted Electron Beam to CCD Camera or STEM Detector

Synchrotron X-ray

- Better energy resolution
- More flexible experiment design
- Chemistry, Phase & Morphology

Performance Degradation Phase Change SEI & dendrite growth Cathode Separator Anode Dissolution Crack & Pulverization

Credit: ACS Nano 2020 14 (2), 1243-1295

Electron Microscopy

- Better spatial resolution
- 'Real-time' video output
- Phase & Morphology

Research Theme: Energy Storage