

Exciting [Faraday Undergraduate Summer Experience \(FUSE\)](#) paid internship opportunities for summer 2025.

Studying a STEM degree? Wondering what career to pursue? Interested in finding out more about the battery sector? Keen to spend time with a dynamic community of pioneering battery researchers seeking to find solutions to support a fully electric future?

The Faraday Institution is offering a total of 48 internships, for undergraduate students to spend 8-weeks working on battery related projects.

Project title: Developing operando X-ray and neutron data analysis routines for pilot line battery cells

Project description:

Understanding Li-ion battery degradation is key to improving their longevity and developing accurate degradation models. Operando X-ray and neutron diffraction techniques provide a non-destructive way to track changes in electrode materials in real time, offering valuable insights into degradation mechanisms. However, these experiments come with significant challenges, not just in execution but also in handling the vast amounts of electrochemical and diffraction data they generate. Streamlining the measurement, data processing and analysis routines is crucial to carry out such experiments in a reliable, sustainable and real-world relevant manner.

Using WMG-built pilot line single and multi-layer cells, this project focuses on integrating operando electrochemical data collection from cells into X-ray and neutron diffraction software, creating a single, correlated dataset. In collaboration with the Polaris beamline at the ISIS Neutron and Muon Source, it involves refining existing Python scripts to process large neutron (and X-ray) diffraction datasets more effectively. This includes adding customisation options for different electrochemical sequences, improving data binning, and enhancing plotting capabilities. The goal is to develop a user-friendly routine that enables rapid crystallographic analysis during experiments, ensuring accurate interpretation of collected data. By streamlining these processes, we aim to make operando studies more accessible for battery research.

Learning objectives:

1. Participate in operando X-ray and neutron diffraction experiments at the Uni. of Warwick and national user facilities (Diamond/ISIS) for single and multilayer pouch cell batteries
2. Develop Python-based GUI to process, visualise and interact with operando diffraction datasets
3. Develop routines for on-line diffraction data for basic crystallographic analysis.
4. Collaborate with the wider WMG and FutureCat teams

Supervisors: Dr Ashok S. Menon, Dr Gabriel E. Perez & Prof Louis Piper

University: University of Warwick

Location: In-person

Start date: The internship is a full-time role for 8 weeks between from June 2025

Eligibility:

- Be registered full-time undergraduate student from a UK university.
- Undertake the internship within the years of their undergraduate study (i.e., not in final year or during a subsequent Masters' programme).
- Not have been a FUSE intern in a previous year

Funding:

A salary of £12.60/hour across the UK or £13.85/hour in London will be provided. This will be determined by the working address of the appointee, not the university's location. The funding is provided by the [Faraday Institution](#).

Additional activities:

During the FUSE internship you will be able to attend Faraday Institution cohort events which will focus on a variety of topics to further develop your understanding of career opportunities in battery sector. At the end of the programme, you will be invited to share a poster about your work and prizes will be awarded.

Application:

In order to apply for FUSE 2025 internship, please send your CV (2-page maximum) and a brief letter (half a page) describing how this internship will help your career to ashok.menon@warwick.ac.uk with 'FUSE 2025 – FutureCat' as the subject on or before April 18th 2025. Shortlisted candidates will be invited to a virtual interview in the two weeks following the deadline.

Diversity:

The Faraday Institution is committed to creating a dynamic and diverse pool of talent for the fields of battery technology and energy storage.

Details about the WMG EDI policies can be found here: [Equality, Diversity & Inclusion - WMG University of Warwick](#)