

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 working on battery related projects.

The Advanced Propulsion Lab at UCL based in UCL's new Marshgate building will host three FUSE internships this year with this project being related to an industry aligned Sprint programme.

Project title: X-ray CT or FIB-SEM: Evaluating the Benefits Two 3D Imaging Techniques for Image-Based Modelling

Project description:

Image-based modelling aims to predict battery performance by applying modelling approaches to a 3D representation of a real electrode. This has the advantage, over other modelling approaches, of making predictions based on the specific microstructure of the electrodes of the device; however, the quality of the model prediction depends on the accuracy of the 3D image. Furthermore, this modelling approach can help us to predict the design of advanced electrode structures for next-generation batteries.

Electrodes generally contain three phases – active material, a carbon/binder domain (CBD) and open pores with the fact that the CBD is itself porous on the nanoscale adding complication. The volume and distribution of porosity determines how the lithium ions diffuse through the electrode, impacting performance. X-ray CT is commonly used to provide input images for image-based modelling; however, due to the low molecular weight of carbon in the CBD, X-ray CT struggles to resolve it. In contrast, FIB-SEM, whilst more technically challenging, produces clearer images of all three electrode phases. This project will image the same real battery electrode with both X-ray CT and FIB-SEM and apply image analysis tools and image-based modelling to determine the best approach to input images for modelling.

During this project:

- Practical experience manufacturing electrodes and carrying out 3D imaging to a sub-micron scale with X-ray computed tomography (X-ray CT) and focused ion beam scanning electron microscopy (FIB-SEM).
- Experience with highly transferrable image analysis tools such as Avizo, ImageJ, iLastik and the PoreSpy and scikit-image Python libraries.
- Understanding of how electrode microstructure has a crucial influence on battery performance through the use of image-based modelling.

Supervisor: Will Dawson and James Robinson

University: University College London

Location: In-person at the Advanced Propulsion Lab, Marshgate, London E20 2AE

Start date: The internship is a full-time (36.5 hours per week) role for 8 weeks during June – September 2025. Start date is flexible, to be agreed with the project lead.

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](#).

You will be paid via the UCL recruitment agency [UniTemps](#).

Additional activities:

During the FUSE internship you will be expected 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 a Faraday Undergraduate Summer Experience (FUSE) 2025 internship, you need to send your CV to James Robinson (j.b.robinson@ucl.ac.uk) with 'FUSE - Manufacture' as the subject and fill in the survey found here: <https://forms.office.com/e/gfv138SQy9>. The deadline for applications is April 25th, 2025.

Diversity:

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

As London's Global University, we know diversity fosters creativity and innovation, and we want our community to represent the diversity of the world's talent. We are committed to equality of opportunity, to being fair and inclusive, and to being a place where we all belong. We therefore particularly encourage applications from candidates who are likely to be underrepresented in UCL's workforce.

You can read more about our commitment to Equality, Diversity and Inclusion here : <https://www.ucl.ac.uk/equality-diversity-inclusion/>