**Exciting** [**Faraday Undergraduate Summer Experience (FUSE)**](https://www.faraday.ac.uk/fuse-internships-2023/) **paid internship opportunities for summer 2023.**

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 55 internships, for undergraduate students to spend 8-weeks working on battery related projects.

**Project title: Investigation of sodiation mechanisms of organic anode materials by pair distribution function analysis**

**Project description:**

Conjugated sodium dicarboxylates show promise as sustainable anode materials for sodium-ion batteries. Materials such as sodium benzenedicarboxylate (Na2BDC) and sodium naphthalenedicarboxylate (Na2NDC) can be synthesized at low temperatures in aqueous solution and show high capacities of up to 192 mA h g–1. Over the last 10 years there has been significant interest in the development of these and related materials, but so far there is no clear picture of the sodiation mechanism and the structures of the sodiated phases are not very well understood. The aim of this project is to use pair distribution function (PDF) analysis to characterize the structural changes upon sodiation. PDF is typically carried out at synchrotrons but at Lancaster we have been working to implement it on a laboratory diffractometer with promising results so far. The PDF data collected will be complemented by solid-state NMR and conventional diffraction data, and interpreted with the help of model structures generated by density functional theory calculations.

Methods used: Solid-state NMR, density functional theory calculations, X-ray diffraction.

The student will be fully supported through-out the project. Full training will be provided for the different approaches used. Good analytical skills, confidence with modelling data and computational simulations and/or programming are desirable.

**Supervisor:** Dr John Griffin, Dr Xiao Hua

**University:** Lancaster University

**Location:** In person

**Start date:** The internship is a full-time role for 8 weeks during June – September 2023.

**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 £10.90/ hour across the UK or £11.95 / 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](https://www.faraday.ac.uk/).

**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

to share a poster about your work and prizes will be awarded.

**Application:**

In order to apply for a Faraday Undergraduate Summer Experience (FUSE) 2023 internship, you need to send a detailed CV, a covering letter stating how you meet the requirements of the studentship to Dr John Griffin by e-mail (j.griffin@lancaster.ac.uk). Informal e-mail enquiries prior to making an application are also welcome.

**Diversity**

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

We warmly welcome applicants from all sections of the community regardless of their age, religion, gender identity or expression, race, disability or sexual orientation, and are committed to promoting diversity, and equality of opportunity.