

FutureCat FUSE 2024 – Lancaster University

Exciting [Faraday Undergraduate Summer Experience \(FUSE\)](#) paid internship opportunities for summer 2024.

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 high-entropy metal oxide electrodes by pair distribution function analysis

Project description:

High-entropy materials show enhanced phase stability due to the high value of mixing entropy compared to the conventional systems. When these materials are applied to batteries as electrodes, they show improved tolerance in volumetric change and chemical diversity with suppressed short-range ordering and frustrated energy landscape, leading to usually better electrochemical performance with respect to capacity, rate, and cycle life. In this project, we will investigate a series of high-entropy (1st-row) transition metal oxides and their reactivity in Li-ion batteries. Specifically, we will explore their phase transition upon Li incorporation and formation of new non-equilibrium phases. Using these new high-entropy phases, we will further assess their feasibility as Li-ion battery electrodes, with a focus on cathode applications.

This internship project entails 1) mechanochemical synthesis for mix-metal oxide preparation; 2) electrode fabrication, battery assembly and testing; 3) analysis of electrochemistry data; 4) XRD and pair distribution function (PDF) data processing, analysis, and interpretation; and 5) characterisation using complementary methods such as solid-state NMR and SEM.

Supervisors: Dr Xiao Hua & Dr Hekang Zhu

University: Lancaster University

Location: In-person

Start date: The internship is a full-time role for 8 weeks during June – September 2024

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 £12.00/ hour across the UK or £13.15 / 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 a Faraday Undergraduate Summer Experience (FUSE) 2024 internship, you need to fill in the (Survey Monkey) application form via this link

<https://www.surveymonkey.com/r/FCatLancaster>

or the QR code below by **Monday 8th April**.

Interviews will be online and are expected to take place week beginning 22nd April 2024. The interview date will be confirmed with shortlisted candidates.

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 Lancaster University EDI policies can be found in the link below:

<https://www.lancaster.ac.uk/edi/>

Scan QR code below for FUSE Lancaster Application form

