Exciting Faraday Undergraduate Summer Experience (FUSE) – SAFEBATT paid internship opportunities for summer 2026

Studying a STEM degree? Wondering what career to pursue? Interested in cutting-edge battery research and contributing to a safer, electrified future?

The Faraday Institution is offering undergraduate students the opportunity to spend 8 weeks working on battery-related research projects as part of its SAFEBATT (Science of Battery Safety) programme.

Project title: ***Deciphering thermal failure pathways towards high-power and safe lithium-ion batteries***

Why does this project matter?

Understanding and preventing battery thermal runaway is important to enabling the safe deployment of high-power batteries in electric vehicles, aviation, and grid-scale energy systems.

Project description:

To achieve net-zero emissions, high-power lithium-ion batteries (LIBs) are increasingly being developed and adopted in electric vehicles, aircraft, and grid-support applications due to their high energy density and fast charge/discharge capabilities. In this regard, the commercial cell INR-21700-P50S demonstrates significant potential to deliver high-power density even at a 20C discharge rate. Such ultra-high power performance is valuable in accelerating the net-zero targets, particularly in hard-to-decarbonise sectors like aerospace and shipping. Despite these considerable advantages, thermal failure remains a challenge for P50s, especially at high charge/discharge C rates and under extreme thermal conditions (e.g., high temperatures). In these situations, the interactions of localised heat generation, internal structural deformation, and gas evolution can become complex, ultimately risking catastrophic thermal runaway if not adequately managed.

Therefore, understanding the thermal failure mechanisms of P50s is crucial for developing batteries that combine high power with safety in real-world applications. This proposal seeks to deliver insights into these mechanisms through methods such as thermal mapping of battery temperature, X-ray CT imaging to monitor electrode structural evolution, thermal abuse testing to identify safety thresholds, and gas analysis to study electrode thermal degradation. Ultimately, this work aims to establish a clear understanding of thermal failure in cutting-edge high-power LIBs.

This project aims to understand the mechanisms behind thermal failure in high-power lithium-ion batteries through an advanced experimental approach. You will explore how thermal, mechanical, and chemical processes interact during battery use and failure, including:

- Infrared thermal imaging to map temperature evolution and identify hotspots
- X-ray computed tomography (CT) to track internal structural changes

- Thermal abuse testing to determine safety thresholds and failure onset
- Mass spectrometry to analyse gas evolution and degradation pathways

By using these techniques, It will build a comprehensive, multi-scale understanding of battery failure, thus contributing directly to the development of safer, high-performance energy storage systems.

During this project, you will:

- Gain hands-on experience in battery safety testing and advanced characterisation techniques
- Work with state-of-the-art tools including thermal imaging, X-ray CT, and gas analysis
- Develop insight into coupled thermal, structural, and electrochemical failure mechanisms
- Analyse experimental data and benchmark findings against current research
- Build skills in scientific communication, including report writing and presentations
- Gain experience in laboratory safety and risk assessment in high-energy systems

Supervisors: Dr Yongxiu Che, Prof. Paul R. Shearing

University: University of Oxford

Location: In-person at Begbroke Science Park, University of Oxford, UK

Start date: Full-time for 8 weeks during summer 2026 (exact dates to be agreed)

Eligibility:

Be a registered full-time undergraduate student at a UK university

Undertake the internship during your undergraduate degree (not in final year or during a subsequent Master's programme)

Not have previously participated in the FUSE programme

Funding:

A salary will be provided in line with Faraday Institution rates (UK and London rates apply depending on working location). It is provided for a real living wage: £13.45/hour in Oxford.

Additional activities:

During the FUSE internship, you will participate in Faraday Institution cohort events designed to broaden your understanding of careers in the battery sector. At the end of the programme, you will present your work in a poster session, with prizes awarded.

Application:

- In order to apply for the FUSE 2026 internship, please send your CV (2-page maximum) and a brief letter (1-page max) describing your interest in the energy storage and battery technology fields, as well as what you are hoping to gain from this summer internship experience, to yongxiu.chen@eng.ox.ac.uk with 'FUSE 2026 – Saftbatt' as the subject.

- Please complete the short Faraday Institution survey that would allow the organisation to keep you updated about relevant webinars this summer and future careers opportunities in the **battery sector**

The deadline for applications is April 25th, 2026. Shortlisted candidates will be invited to a virtual interview within two weeks following the deadline.

Diversity:
The Faraday Institution is committed to building a diverse and inclusive research community. We welcome applications from all backgrounds and particularly encourage candidates from underrepresented groups in STEM.