THE FARADAY INSTITUTION LEAP

LITHIUM-ION: ENHANCING AND ACCELERATING PERFORMANCE

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

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: Exploring Reaction Network Modelling for Electrolyte Degradation Prediction

Project description:

Electrolyte degradation is a key factor limiting the lifetime of Li-ion batteries. Understanding how an electrolyte decomposes is directly connected to designing a more stable solid electrolyte interphase (SEI) at the anode. Atomistic simulations can help elucidate and optimise electrolyte compositions through the selection of target solvation structures. However, considering solvation alone is not sufficient to predict SEI formation. In this proposal, we aim to develop a model to predict electrolyte degradation pathways using atomistic simulations informed by solvation structures. A major bottleneck in computational reaction mapping is identifying which reactions are most likely to occur, as opposed to those with minimal relevance. To address this, our methodology combines atomistic simulations with systematic data analysis. The screening of the dominant reaction pathways can be integrated into large-scale reactive molecular dynamics simulations to predict SEI formation and support experimental observations, especially because these reactions are difficult to capture during battery operation.

Supervisors: Dr. Juliane Fiates and Dr. James A. Dawson

University: Newcastle University

Location: in person, Newcastle

Start date: The internship is a full-time role for 8 weeks starting the 8th of June 2026.

Project title: Computational Design of Intermetallics as Anode Materials for Solid-State Batteries

Project description: Solid-state batteries (SSBs) are widely regarded as the most promising successor to Li-ion batteries, potentially offering energy densities above 1000 WhL^{-1}, faster charging, enhanced safety and extended cycle life. Nearly all major automotive manufacturers are investing in SSB R&D, with concept vehicles expected within the next five years. Nevertheless, many battery manufacturers remain cautious about the feasibility of scaling up SSBs in the near term. One of the main reasons for this is that the performance of SSBs is fundamentally limited by contact loss and void formation in pure lithium metal electrodes, caused by restricted lithium transport and plastic flow. Research from the SOLBAT team has illustrated that solid-solution alloying (e.g., Li–Mg) substantially reduces void formation, while ternary (e.g., Li–Mg–Bi) alloys introduce intermetallic phases that act as fast diffusion pathways, homogenising delithiation and supporting high-rate cycling. Building upon this research, this FUSE project will utilise atomistic modelling, including density functional theory and molecular dynamics, to screen lithium-containing intermetallics as potential SSB anodes. We will focus on binary

and ternary systems (primarily Bi and Sn based) and calculate their thermodynamic stability and relevant physical properties, including lithium diffusivity and interfacial energies with metallic lithium.

Supervisor: Dr. James A. Dawson

University: Newcastle University

Location: in person, Newcastle

Start date: The internship is a full-time role for 8 weeks starting the 8th of June 2026.

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 **£13.45** / hour across the UK or **£14.80** / 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) 2026 internship, you need to complete the online form.

Deadline: Monday 27 April 2026, 23:59.

APPLY HERE: Application for FUSE 2026 Deadline: 27th of April 2026, 23:59 – Fill out form

Diversity:

The Faraday Institution is committed to creating a dynamic and diverse pool of talent for the fields of battery technology and energy storage. At Newcastle University, we are dedicated to fostering an inclusive community in which every individual feels valued. Our commitment to equality, diversity, and inclusion (EDI) is underpinned by our EDI Strategy which guides our efforts to ensure that all colleagues and students thrive in a values-led environment. You can read Newcastle's full Equality, Diversity and Inclusion strategy here: https://www.ncl.ac.uk/edi/

Please also complete this survey so we can keep you informed about future Faraday opportunities, including other FUSE internships that may need additional support with recruitment.