

**Exciting [Faraday Undergraduate Summer Experience \(FUSE\)](#) paid internship opportunity 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:** Towards preventing degradation in next-generation lithium-rich cathode materials

**Project description:**

Batteries using lithium-rich cathode materials have the potential to increase electric vehicle driving ranges as they have the capacity to store more energy.

When a normal cathode material (e.g.  $\text{LiCoO}_2$ ) is charged,  $\text{Li}^+$  ions are extracted, accompanied by a change in oxidation state of the transition metal ion. Lithium-rich cathodes are different. More  $\text{Li}^+$  ions can be extracted, meaning that these cathodes can store more charge. However, to compensate not only are the transition metal ions oxidized, but so too are the  $\text{O}^{2-}$  ions in the lattice. This is commonly referred to as oxygen redox.

Oxygen redox presents a serious challenge because it leads to loss of gaseous  $\text{O}_2$  from the surface of the lithium-rich cathode particles during cycling, resulting in irreversible capacity loss. In this project, lithium-rich cathode materials will be coated in thin layers of inorganic material to prevent the loss of gaseous  $\text{O}_2$  and improve the battery cycling performance.

**Supervisor:** Dr Dominic Spencer-Jolly and Prof Emma Kendrick

**University:** University of Birmingham

**Location:** In person

**Start date:** The internship is a full-time role for 8 weeks over June – August (start-date flexible)

**Eligibility:**

- Be a 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 will be 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 the 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 this Faraday Undergraduate Summer Experience (FUSE) 2024 internship, please send PDFs of (i) your CV and (ii) a short statement as to why you'd like to undertake this internship (max. 300 words) to Dr Dominic Spencer-Jolly ([d.h.spencer-jolly@bham.ac.uk](mailto:d.h.spencer-jolly@bham.ac.uk)) before 15/04/2024 at 09:00.

**Diversity:**

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

[Equality, Diversity and Inclusion at the University of Birmingham](#)