THE FARADAY INSTITUTION Degradation
EXTENDING BATTERY LIFE

Exciting Faraday Undergraduate Summer Experience (FUSE) 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

Functionalized carbon nanotube electrodes for Li-air batteries

Project description

Lithium-air batteries are very promising energy storage devices thanks to their great energy density combined with low cost and environmental impact. Many challenges still need to be overcome for their commercialization, amongst them tuning the structure and activity of the air electrode, where the oxygen reduction and evolution reactions occur. Carbon nanotubes (CNTs) are very promising materials for their use in air electrodes due to their high conductivity, surface area and stability. They can also be used to form electrodes with different morphologies, porosity, and chemical activity via decoration with catalytic nanoparticles, doping, functionalization, etc.

In this study, we will evaluate the performance of lithium-air batteries with various types of CNT-based electrodes, including functionalized-CNTs with organic molecules for increased power output and lifetime. The intern will learn to assemble and test Li-air batteries, as well as characterise the battery components using a range of techniques (XRD, SEM, and titration). A key of this project will be the use of a newly developed operando XRD cell to visualize the formation of discharge products during battery cycling.

In conducting the project, you will gain a wide knowledge of post-intercalation battery systems, and in particular Li-air batteries, as well as battery testing strategies and materials characterisation techniques. As part of the project you will be supported by leading academics to develop skills in battery assembly and testing which underpin the development of all types of energy storage devices. Throughout the project you will develop your research skills while working in a team in this exciting area.

Supervisor Dr Israel Temprano, in the group of Prof Dame Clare Grey

University University of Cambridge

Location In-person, in Cambridge

Start date The internship is a full-time role for eight 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

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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.

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

To apply, please complete this survey by 23.59 on 17 April 2023.

For project information, please visit https://faraday.ac.uk/research/lithium-ion/extending-battery-life/

Diversity

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

The University of Cambridge is committed in its pursuit of academic excellence to equality of opportunity and to a pro-active and inclusive approach to equality, which supports and encourages all under-represented groups, promotes an inclusive culture, and values diversity.