**Exciting** [**Faraday Undergraduate Summer Experience (FUSE)**](https://www.faraday.ac.uk/fuse-2022/) **paid internship opportunities for summer 2022.**

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 56 internships, for undergraduate students to spend 8 weeks working on battery related projects.

**Project title:** Flow battery design for energy storage

**Project description:**

Flow batteries differ from conventional batteries by storing their active materials in external electrolyte reservoirs. The soluble lead flow battery (SLFB) is being developed under the RELCoBat project and differs from other flow batteries as it uses the same active material, solvated Pb2+ ions, for both electrode reactions. This means it only required a single electrolyte which is pumped through stacks of cells during operation. Engineering challenges associated with this include complex cell and fluid flow circuits that must balance pressure drop, cell sealing and mass transport. To achieve this, however, careful consideration is needed to tailor the electrolyte path length between cells and to ensure good mixing within the reservoir. The focus of this internship is to investigate the design, using both experimental data and computational investigations, of an integrated cell and reservoir system for the SLFB.

Technical objectives will include:

* Carry out an extensive literature review of the SLFB system to identify electrolyte properties, such as, ionic conductivity, viscosity and density.
* Perform an conceptual design investigation and characterisation of the reaction chamber to allow electrical connection between battery cells and mass transport of electrolyte throughout.
* Use 3D printing technologies to prototype a cell for testing of the electrolyte pump and distribution system and perform experimetnal investigations into the fluid flow within the reaction chamber to understand the internal mixing whilst ensuring minimal leakage of currents between cells.
* Electrochemically characterize, using a variety of charge/discharge techniques, the cell prototype.

Further objectives will include:

* Working alongside the RELCoBat research team at the Universities of Southampton and Sheffield.

Disseminate results to academic and industrial partners.

**Supervisor:** Dr Richard Wills (rgaw@soton.ac.uk)

**University:** University of Southampton

**Location:** *Southampton (In-person)*

**Start date:** The internship is a full-time role for 8 weeks: June – September 2022.

**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 £9.90 / hour across the UK or £11.05 / 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](https://www.faraday.ac.uk/). *[Please amend if university has an agreed rate across all its internship programmes that is being matched – see grant letter for more details]*

**Additional activities:**

During the FUSE internship you will be able to attend Faraday Masterclasses and 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

to share a poster about your work and prizes will be awarded.

**Application:**

In order to apply for a Faraday Undergraduate Summer Experience (FUSE) 2022 internship, you need to email Dr Richard Wills ([rgaw@soton.ac.uk](mailto:rgaw@soton.ac.uk)) with your CV by 1st May 2022.

**Diversity**

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

We aim to be an equal opportunities employer and welcome applications from all sections of the community. **Please note that applications from agencies will not be accepted unless indicated in the job advert.**