**Exciting PhD opportunity with the** **Faraday Institution****.**

Looking for a battery related career that contributes to creating a sustainable future? Keen to join a dynamic community of pioneering battery researchers seeking to find solutions to support a fully electric future?

The Faraday Institution Cluster PhD researchers receive an enhanced stipend over and above the standard EPSRC offer. The total annual stipend is approximately £20,000 (plus London weighting where applicable) plus an additional training and consumables package worth £7,000. Recipients will have access to multiple networking opportunities, industry visits, mentorship, internships, as well as quality experiences that will further develop knowledge, skills, and aspirations. Read more.

Take a look at the bespoke training programme on offer.

**University:** Cambridge

**Project title:** Expanding the Range of Sodium Electrolytes- Bigger anions, Supramolecular Size Control, and Ionic Liquids

**Project description:**

The programme is focused on the development of new sodium electrolyte salts for next-generation sodium-ion batteries. New salts of the type NaX will be synthesised which contain a range of main group-centred anions (X; boron-, phosphorus- and silico- based). Changing the steric bulk and chain length of the organic substituents in the anions will allow us to alter the thermochemical radius of the anion and the overall physical properties of the salts themselves. In turn, this will provide the means for increased ionic conductivity and electrochemical and chemical stability, and for the formation of ionic-liquid electrolytes. Further studies involving supramolecular anion complexation will be aimed at ‘super-sizing’ the anions using additives.

The research combines skills in inorganic synthesis with detailed electrochemical analysis and battery testing (both in-house and with collaborating industrial partners). The synthesized electrolytes will be characterized using fundamental electrochemical methods (impedance spectroscopy, cyclic voltammetry) and tested in real-world battery setups. Electrolyte degradation and electrode interface evolution will be investigated using nuclear magnetic resonance (NMR) and X-ray photoelectron spectroscopy (XPS).

**Start date:** 3rd October 2022

**Supervisor:** Prof. Dominic S. Wright (dsw1000@cam.ac.uk) and Prof. Clare P. Grey (cpg27@cam.ac.uk). Applicants should direct informal enquiries to Prof. Wright in the first instance.

**Eligibility:**

Applications are welcome from home and international students (although places for international students are limited. Please see UKRI guidance for more details).

Applicants should have a degree with (or and) masters in chemistry (minimum 2.1 or equivalent). A strong background in synthetic inorganic chemistry is highly desirable, as is interdisciplinary background and/or experience (especially involving materials chemistry and electrochemistry).

**Application:**

In order to apply for a Faraday Institution PhD position, you need to do both of the following:

1. Complete a Faraday Institution expression of interest form (<https://www.surveymonkey.co.uk/r/7ZVPYRB>)
2. Follow the university application process as follows:

To apply, please email a cover letter, CV, detailed academic transcripts and the contact details for at least two academic referees to: Prof Dominic Wright (email: dsw1000@cam.ac.uk). Your cover letter should explain why you wish to be considered for the studentship and describe the qualities and experience you would bring to the role. Please quote reference MA31022 on your application and in any correspondence about this vacancy (full details of the project and can be found on https://www.postgraduate.study.cam.ac.uk/courses/studentships/ma31022). Please also state in your application whether you are a UK/home or international student.

To apply, please email a cover letter, CV, detailed academic transcripts and the contact details for at least two academic referees to: Prof Dominic Wright (email: dsw1000@cam.ac.uk). Your cover letter should explain why you wish to be considered for the studentship and describe the qualities and experience you would bring to the role.

**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 actively supports equality, diversity and inclusion and encourages applications from all sections of society