Testing Methodologies for Automotive Lithium Ion Batteries (EngD)

**Funding:** Funded for 4 years (UK/EU student)
**WMG Supervisors:** Mr. Mark Amor-Segan, Prof. Dave Greenwood
**Start Date:** As early as possible

**Project Overview**
This is a fantastic opportunity to join WMG’s University of Warwick, the foremost UK facility for battery innovation, research and development in association with Millbrook, the leading UK vehicle testing facility for the design, engineering and development of automotive and test technology propulsion systems, with a customer base ranging across the automotive, transport, petrochemical and defence industries. More details can be found here:

WMG: [https://warwick.ac.uk/fac/sci/wmg/research/electrochemical_engineering/](https://warwick.ac.uk/fac/sci/wmg/research/electrochemical_engineering/)
Millbrook: [http://www.millbrook.co.uk/](http://www.millbrook.co.uk/)

Lithium-ion batteries are seeing increasing utilisation for automotive energy storage. They are used on-board vehicles in a wide range of technological applications demanding higher capacity, high rate capability and extended cyclability, and there is an increasing need to further develop robust testing techniques and protocols. The key metrics for how these systems perform are energy capacity, specific power and life, with critical understanding required of how these change with age.

This studentship focuses on the testing of electrochemical power devices, and how to use techniques and best practise from battery research and translate this into large-scale commercial validation and development, progressing the latest advances in electrochemical performance testing, characterisation and certification for batteries.

**Key Objectives:**
- Characterise commercial lithium ion pouch, cylindrical and prismatic cells.
- Characterise automotive battery modules and battery packs.
- Develop experimental jigs and apparatus to support your research
- Develop commercially applicable battery characterisation techniques
- Investigate ageing behaviour and develop accelerated ageing tests.

As an Engineering Doctorate, this project has a unique relationship between research and industry, with an emphasis on innovation and addressing real world issues, with time split between both organisations. You will have full access to state-of-the-art facilities in WMG’s Energy Innovation Centre and Millbrook.

Since becoming part of the Spectris group, Millbrook has made significant investment in advanced low emission vehicle technology, with a customer base ranging across the automotive, transport, petrochemical and defence industries. Millbrook’s battery and propulsion systems test capabilities will bring new technologies to market sooner for the full range of hybrid and battery electric vehicle powertrains. Currently under construction and due in Q4 2018 are 12 new battery test beds, each with the capability to test complete automotive battery packs up to 1100V, 1400A, 750kW over a wide temperature range: from -40°C to +90°C, with further battery test facilities expansion under review for 2019-2020. Please see [http://www.millbrook.co.uk/press-office/news/millbrook-expands-battery-test-facility-investment-to-meet-surring-industry-demand/](http://www.millbrook.co.uk/press-office/news/millbrook-expands-battery-test-facility-investment-to-meet-surring-industry-demand/) for more information.
Entry Requirements

Qualifications
Candidates should have a minimum of an upper second (2.1) honours degree (or equivalent) in a relevant subject electrical, materials or mechanical engineering. Previous experience of working on this type of research in an industrial or academic setting is highly desirable, but also welcome applicants from adjacent sectors with relevant skills.

Studentship Funding
Due to funding regulations, the applicant should be eligible as a UK/EU student. A stipend of £16,277 + 4000 will be paid per annum for 4 years.

To apply
To apply please complete our online enquiry form and upload your CV.