

## Innovative Heating Technologies for Composites Manufacture

4 year Engineering Doctorate Position with Cranfield University and Heraeus Noblelight, Cambridge, UK

Application Deadline: 31<sup>st</sup> January 2018

Start Date: asap

Eligibility: UK, EU

Duration of Award: 4 years

Academic Supervisor: Dr Alex Skordos – Cranfield University

Industrial Supervisor: Dr David Williams – Heraeus Noblelight

Studentship: £20,000 (tax free) per year plus fees

Sponsors: Industrial Doctorate Centre (IDC) in Composites Manufacture, Heraeus Noblelight

Composite materials are used in many industries, including aerospace and automotive, due to their advantageous material properties. The manufacturing processes used to make the composite components found in cars, aircraft all use heating technologies to melt, soften or cure the constituent materials. There is a on-going need to increase the speed and quality of these processes, in order to satisfy growing demand in each industry, but current trial-and-error heating methods leave little opportunity for rapid and significant improvement. Therefore, a deeper understanding is required of the heating performance of the materials involved, combined with a knowledge of which heating technology is best for each process.

Heraeus Noblelight has invented a breakthrough heating technology based on their Xenon Flashlamp energy source, which is capable of providing pulsed, broadband energy for the processing of composites. This innovative technology has the potential of lowering manufacturing costs and increasing production rates in a range of composites manufacturing processes, and may even allow composites to expand into components and applications outside the current feasibility envelope.

This EngD project targets the development, optimisation and industrial integration of the Heraeus heating technology in processes such as Automated Fibre Placement, Filament Winding and Thermoforming. The work will involve the investigation of the underlying physics of the interaction of pulsed Flashlamp energy with composite materials, the development of predictive models of the processes involved, the design and implementation of laboratory trials and characterisation experiments, and the optimisation of processing conditions for different applications.

In addition to the research activities, the student will be involved in all stages of product development, including design reviews and end-user trials in the UK and around the world. This project will give the student the opportunity to be part of a vibrant, highly innovative research group and to publish their research in academic journals and at leading international conferences.

The project will be based at Heraeus Noblelight on the Cambridge Science Park. The student will spend 75% of their time in Cambridge on the industry-led research project, with the remaining time allocated to attending specialist taught units at the National Composites Centre in Bristol. The candidate will be registered as an EngD student at Cranfield University.

For further information on the recent developments by Heraeus Noblelight please visit:

[https://www.heraeus.com/en/hng/products\\_and\\_solutions/arc\\_and\\_flash\\_lamps/humm\\_3.aspx](https://www.heraeus.com/en/hng/products_and_solutions/arc_and_flash_lamps/humm_3.aspx)

For further information about the IDC and the EngD programme please visit:

<http://www.epsrc-cimc.ac.uk/idc>

Entry requirements: Applicants should have a first or second class UK honours degree or equivalent in a related discipline, such as Mechanical Engineering, Materials Science, Physics, Chemistry or Chemical Engineering.

For further information please contact: Dr Alex Skordos, email [a.a.skordos@cranfield.ac.uk](mailto:a.a.skordos@cranfield.ac.uk) or Dr David Williams, email [david.williams@heraeus.com](mailto:david.williams@heraeus.com)