

Imperial College London

Department of Mechanical Engineering

PhD in Modelling and developing high-performance ductile composites

Applications are invited for a PhD studentship in the field of modelling and developing high-performance ductile composites, leading to the award of a PhD degree. The post is supported by a bursary and fees (at the UK/EU student rate) provided by EPSRC. Candidates should therefore fulfil the eligibility criteria for this Award (please check your suitability at:

<http://www.epsrc.ac.uk/skills/students/help/Pages/eligibility.aspx>

This studentship is part of HiPerDuCT (High Performance Ductile Composite Technologies), a joint programme between Imperial College and the University of Bristol aiming to overcome a key limitation of composites – their inherent brittleness. HiPerDuCT's goal is to develop a new generation of high-performance and ductile composites, capable of sustaining large deformations before breaking, and suitable for safety critical and damage tolerant applications.

The key challenge of this PhD project is to combine micromechanical modelling and experiments to explore the potential of unidirectional fibre composites to exhibit large extensions before failure. Several routes will be investigated, including modifying the material architecture (e.g. by using discontinuities or hierarchies) or tailoring the response of the matrix. This PhD project requires excellent Solid Mechanics, Mathematics and Materials Science skills, which will be applied and further developed in both modelling and experimental work.

During this PhD project, the research student will:

- Develop analytical and/or computational micromechanical models for the deformation and failure processes of composites with modified architecture and constituents;
- Propose, manufacture and test new unidirectional fibre composites with potential for combining high stiffness, high strength and improved ductility;
- Collaborate with colleagues within the HiPerDuCT team (spanning over Aeronautics, Chemical Engineering and Chemistry at Imperial College, as well as the University of Bristol);
- Write scientific papers for publication in top-level journals in Materials Science/Physics/Numerical Methods/Mathematics;
- Present his/her research in project meetings, international conferences and outreach events;
- Work in close collaboration with the supervisors, while being the driving force for his/her own PhD.

The successful applicant will be an enthusiastic and self-motivated person who meets the academic requirements for enrolment for the PhD degree at Imperial College London. You will have (or be about to obtain) a 1st class (or equivalent) degree in Mechanical Engineering, Aeronautics, Materials Science, Mathematics, or other relevant subject. You will become a skilled communicator, comfortable in an international situation. Good team-working, observational and communication skills are essential.

To find out more about the HiPerDuCT programme, go to:

<http://gtr.rcuk.ac.uk/project/94A87C82-2284-4E27-A6DA-5BA06996E2C6>

For information on how to apply, go to:

<http://www.imperial.ac.uk/mechanicalengineering/research/phdopportunities>.

For further details of the post contact Dr Soraia Pimenta soraia.pimenta@imperial.ac.uk. Interested applicants should send an up-to-date curriculum vitae to Dr Pimenta on the above e-mail address. Suitable candidates will be required to complete an electronic application form at Imperial College London in order for their qualifications to be addressed by College Registry.

Closing date: until position is filled

Committed to equality and valuing diversity. We are also an Athena Bronze SWAN Award winner, a Stonewall Diversity Champion and a Two Ticks Employer