PhD Studentships in the
Department of Materials Science
University of Cambridge

This document lists project studentships which are fully funded and usually available immediately, if not then usually they are available from the start of the next academic year. The majority are available to ‘home rate fee’ paying students only.

For other information, please contact:
Dr Rosie Ward
Department of Materials Science and Metallurgy
University of Cambridge
27 Charles Babbage Road
Cambridge CB3 0FS

Tel: +44 1223 331955
Email: remw2@msm.cam.ac.uk

Please include a CV and state your project(s) of interest.
PhD Studentships

Fully-funded PhD studentships

PhD Studentship: Developing new methods for studying the local atomic structure in the FeCo alloys needed for electric aircraft

Funder: EPSRC Industrial CASE award in collaboration with the University of Sheffield and Rolls Royce plc
Duration: 1 October 2023 – 30 September 2027
Supervisors: Professor Howard Stone & Professor Paul Midgley
Closing date: 31 December 2022

Applications are invited for a PhD studentship developing new methods for studying the local atomic structure in FeCo soft magnetic alloys. The studentship is fully funded for an individual eligible for home-student status and will run for up to four years from October 2023. The project will be run in collaboration between the universities of Cambridge and Sheffield, and Rolls-Royce plc.

Electric aircraft will soon revolutionise civil aviation and dramatically reduce emissions. One of the key technologies required to achieve this are new higher-power density electric motors. The latest designs of such motors require high performance FeCo soft magnetic alloys for the motor cores. However, for these alloys to be used safely an improved understanding is required of the origins of their exceptional properties and how they are influenced by the unusual atomic arrangements know to occur in these alloys.

In this project, state of the art transmission electron microscopy facilities will be used to develop new methods for the characterisation of local atomic structure in alloys. This will utilise a state-of-the-art FEG monochromated, and probe corrected scanning transmission electron microscope recently installed in the Department of Materials Science and Metallurgy at Cambridge. Once established these characterisation methods will be used to gain an improved understanding of the local atomic structure and short-range order that exists in FeCo alloys and strongly influences their properties. Whilst the work will principally use transmission electron microscopy, there will be opportunities use a wide range of experimental techniques including scanning electron microscopy, calorimetry, X-ray diffraction, magnetic and mechanical property testing.

The project will be based in the Department of Materials Science and Metallurgy at the University of Cambridge and will be conducted in collaboration with the University of Sheffield. The project will be continuously supported by Rolls-Royce plc throughout.

Applicants should have (or expect to be awarded) an upper 2nd or 1st class honours degree at the level of MSci, MEng (or overseas equivalents) in a relevant subject (Physics, Chemistry, Materials Science, Maths). Funding for eligible students covers research expenses, tuition fees and includes a tax-free ‘stipend’ of £22,668 per year for living costs, which is paid in monthly instalments to the student.

EPSRC Doctoral Training Partnership studentships are fully-funded (fees and maintenance) for eligible students who are liable for ‘home rate’ fees. EU and international students may also be considered for these awards, although they may be required to cover the difference in fee level between home and overseas rates.

Applications are made through the ‘applicant portal’ at https://www.postgraduate.study.cam.ac.uk/.
Further information on the application process is available from Dr Rosie Ward (remw2@cam.ac.uk).
Informal enquiries may be made by email to either Prof Howard Stone (hjs1002@cam.ac.uk), Prof Paul Midgley (pam33@cam.ac.uk), or Dr Lewis Owen (lewis.owen@sheffield.ac.uk).

**PhD projects for which funding is available from the Department on a competitive basis**

**PhD Studentship: Medical Materials**

**Supervisor:** Professors Serena Best and Ruth Cameron  
**Start date** October 2022

A range of PhD projects will be available within the Cambridge Centre for Medical Materials to start in October 2022.

Information about current research is available at the group website [https://www.ccmm.msm.cam.ac.uk](https://www.ccmm.msm.cam.ac.uk).

Research fields include ice templated biomacromolecular scaffolds, peptide control of cellular response, bioactive ceramics, 3D printed devices, resorbable polymers and composites, antibacterial materials, pharmaceutics and drug delivery. Fields of application include orthopaedic and dental surgery, cardiac and neural repair, stents, lung disease models and microtissues for pharmaceutical research.

For further information contact Prof. Serena Best (smb51@cam.ac.uk) and Prof. Ruth Cameron (rec11@cam.ac.uk).

*The University of Cambridge and the Department of Materials Science & Metallurgy value diversity and are committed to equality of opportunity.*