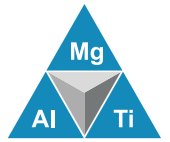




The University of Sydney



Electron Microscope Unit

Australian Key Centre for Microscopy and Microanalysis

Australian Microscopy & Microanalysis Research Facility (AMMRF)

ARC Centre of Excellence for Design in Light Metals

PhD Scholarship Opportunity

Scholarship available on Mechanical Properties of Magnesium alloys

A JW and ICM Roderick Scholarship is available for a suitably qualified student with an Honours degree (or equivalent) in Engineering or Science to undertake full time research leading to a PhD degree on the subject of studying and modelling the mechanical behaviour of hexagonal materials during complex loadings.

The project aims to develop a comprehensive crystal plasticity model to predict stress-strain curves and texture evolution of hexagonal close-packed metals during complex loadings. Plastic deformation of hexagonal close-packed (hcp) metals occurs by the activation of different slip and twinning systems depending on temperature, strain rate and loading direction. The mechanical behaviour of these materials becomes even more complex once the loading direction and/or the temperature at which deformation is conducted are changed. Different crystal plasticity models have been developed to reproduce the hardening and texture evolutions of such materials. Although, these models capture relatively well the behaviour of hcp metals during simple loadings, they fail to reproduce complex loading behaviours. The PhD student will have the opportunity to characterise the microstructure evolution of various hcp metals and to develop constitutive laws that take into account phenomena due to pre-straining such as the interactions between deformation mechanisms. This model will enable the enhancement of the processing technology of these materials and the discovery of new applications for them.

Applicants must have a good degree in engineering or science and an interest in materials science and engineering. The scholarship stipend is \$20,427 per annum in the first year, and may be held for three years subject to satisfactory progress. International students can apply but the scholarship does not cover any tuition fees. **Separate tuition fees scholarships may be provided for international students from the School of Civil Engineering.**

Further information can be obtained from Dr Gwénaëlle Proust, School of Civil Engineering and Australian Key Centre for Microscopy and Microanalysis, The University of Sydney, NSW 2006. Applications including a full curriculum vitae, a copy of an academic transcript, and the names and contact details of at least two referees should be sent to Dr Proust at the address to the right.

Further Information:

Dr Gwénaëlle Proust

Lecturer

Phone: +61 2 9036 9491

Email: g.proust@usyd.edu.au

Australian Key Centre for Microscopy and Microanalysis

The University of Sydney

NSW 2006, Australia

www.emu.usyd.edu.au