PhD Scholarship

“Studies of magnetic order in anisotropic rare earth intermetallic single crystals.”

A post-graduate research scholarship is available in the School of Physical, Environmental & Mathematical Sciences at The University of New South Wales Canberra for a PhD Candidate.

Project Details:
Rare earth intermetallic compounds are of pivotal importance to a wide range of technologies. They form the basis of the strongest permanent magnets and some of the most promising magnetic refrigerants (magnetocaloric materials). The central mechanisms at play in these materials are the combination of crystalline anisotropy and the magnetic (exchange) interactions between the rare earths themselves and/or the other magnetic ions in the compounds.

This project will focus on developing an understanding of several families of intermetallic compounds, known to show complex low temperature magnetic order and magnetic field driven (metamagnetic) phase transitions. The exact nature of the magnetic phases as a function of temperature and applied magnetic field is to be determined and a combination of crystal field modelling and neutron diffraction analysis is required.

Overall, this project will provide an excellent educational opportunity for a research student, leading to an understanding of magnetism and crystal field theory as well as the application of a variety of experimental techniques ranging from bulk physical property measurements such as magnetisation, susceptibility and heat capacity, through to the use of the microscopic probe techniques such as magnetic resonance, neutron diffraction and low temperature nuclear orientation. It offers the chance for a student to participate in a multi-faceted project that will also involve collaboration with the University of Toyama, Japan, as well as measurements at The Bragg Institute, ANSTO (reactor OPAL) in Sydney.

The successful applicant, subject to admission will be awarded a UNSW Canberra Research Training Scholarship with an annual tax-free stipend of $25,853 (2013 rate). This scholarship is for a period of 3 years and is subject to satisfactory progress reviews. The successful applicant would be expected to be available to commence their studies no later than Session 1, 2014 and must be on campus and enrolled at UNSW Canberra in the relevant PhD program by 31 March 2014. Applications will be accepted until a suitable candidate is found.

The Canberra campus of the University of New South Wales is located at the Australian Defence Force Academy (ADFA). ADFA is located in an Australian bushland setting less than five kilometres from the city centre and the Canberra airport.

The UNSW Canberra campus has a large and comprehensive library, state-of-the-art computing facilities, well-equipped and modern laboratories.

For further information, please contact:
Dr. Wayne Hutchison
Email: w.hutchison@adfa.edu.au
Phone: +61 2 6268 8804
School of Physical, Environmental & Mathematical Sciences
The University of New South Wales
Canberra ACT 2600 Australia