



PhD Position: Electron and Nuclear Interactions in High Magnetic Fields

One of the primary goals of Electron Magnetic Resonance is to measure and understand electron-nuclear hyperfine interactions to obtain a detailed understanding of the local molecular environment of unpaired electrons in important material, chemical and biomolecular systems. These paramagnetic centres often define a materials electronic or optical properties or are central to the role of catalysts or enzymatic activity. Understanding the detail of electron-nuclear interactions are also central to optimisation of many DNP methodologies. Pulse and double resonance methodologies are key to providing sufficient spectral resolution to resolve different centres in otherwise broadened spectra, whilst measurements at high fields allow differentiation and identification of different nuclear centres. The project will be carried out by using and optimising a state-of-the-art high field EPR spectrometer developed under the UK Basic Technology Program, which can output complex pulse sequences at power levels 3000 times larger than equivalent commercial instrumentation. The goal of this project is to demonstrate state-of-the-art sensitivity and capability for hyperfine measurements and impact across a wide range of interdisciplinary research areas.

The successful candidate will join the mm-wave and EPR group based at the St Andrews Magnetic Resonance Centre, which includes collaborators from Physics, Chemistry and Lifescience at St Andrews and Dundee Universities. Research within the group focuses on many aspects of pulse and high field EPR instrumentation and hardware development as well as on spectroscopy including a large range of biophysical projects related to PELDOR. This collaborative project will also be strongly linked to research programs at the Universities of Warwick and Dundee.

For further information contact Graham Smith (gms@st-and.ac.uk) or imr.cdt@warwick.ac.uk

The Centre for Doctoral Training in Integrated Magnetic Resonance (*IMR*) is a collaboration between researchers at the Universities of Warwick, St Andrews, Southampton, Aberdeen and Nottingham.