PhD Studentship in Quantum Technologies

Project Title: Advanced Spintronics for Semiconductor Quantum Nanostructures

Applications are invited for a CASE studentship in the Department of Electronic & Electrical Engineering at University College London (UCL) and London Centre for Nanotechnology, LCN. Since the funding is provided by the Engineering and Physical Sciences Research Council and Toshiba Cambridge Research Laboratory the studentship is only available to those applicants who are UK or EU nationals. Applicants should possess a 1st or 2.1 degree in Electrical Engineering or Physics. The studentship is for 3.5 years.

Description: The Ph.D project will involve experimental work in both UCL and Toshiba Cambridge, it is based on experimental techniques for the manipulation of spins in semiconductor nanostructures. It is intended to investigate new aspects of quantised conductance in one dimension, 1D, which are derived from the electron-electron interaction in a similar way to the Fractional Quantum Hall effect in two dimensions, 2D.

The project will develop spin controlled transistors where spin polarised electrons are injected into other 1D systems or 2D electron gases. We will develop new types of integrated nanostructures for investigation of quantum phenomena and determine if the observed effects can be used for spintronic applications where the spin contains the information.

It also intended to investigate a predicted range of quantum phenomena based on the combination of proximity induced superconductivity and the Spin-Orbit Interaction. In order to accomplish this we have developed Spin-Orbit Coupled devices where the exchange interaction and the spin state of the electrons can be altered by applying controlling electric fields.

The studentship should commence before the 1 October 2017 although a later start can be considered. For UK nationals, the award will cover UK tuition fees and a tax-free maintenance stipend. EU students are eligible for an award to cover tuition fees only.

Applicants should, in the first instance send a CV, to Professor M Pepper, michael.pepper@ucl.ac.uk.

Closing Date: 30 September 2017