

PhD position - Dynamical Simulations of Hot-Electron Quantum Optics

Wed, 2018-01-17 15:14 - [Clive Emary](#) [1] **At:** Newcastle University, UK

Deadline: 26 January, 2018

Location

Newcastle University Newcastle United Kingdom

See map: [Google Maps](#) [2]

Dynamical Simulations of Hot-Electron Quantum Optics

Overview

Quantum-dot charge pumps can act as reliable on-demand sources of single electrons. Not only are these sources proposed for use in an array of cutting-edge metrology applications, they also open up a new route to realise quantum-optics-like experiments with electrons in the solid state. Since these electrons are 'hot', ie have energies far in excess of the Fermi level, their quantum-coherence properties are expected to be very different to those of electrons from standard sources.

The aims of this project are: to develop realistic numerical simulations of hot-electron devices, to analyse and optimise a variety of quantum-optics geometries, and to investigate applications in quantum electronics, quantum computation and quantum-enhanced metrology.

This is a theoretical/computational project but the work will be carried out in close collaboration with world-leading experimentalists at the National Physical Laboratory.

You will work together with supervisor [Dr Clive Emary](#) [3] of the School of Mathematics, Statistics and Physics at Newcastle University, as well as Dr Andrea Bertoni at CNR NANO, Modena, Italy, and the experimental team of Dr Masaya Kataoka at the National Physical Laboratory (NPL).

Value of award

A tax-free stipend of £14,553 per year (subject to minor change) and 100% tuition fees. The studentship also includes a desktop computer and £1,500 travel allowance.

Start date and duration

September 2018 for 42 months

Application closing date

26 January 2018

More information

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