

From: Jennifer Inman <jennifer.a.inman@nasa.gov>
Subject: [Fwd: Fully-funded PhD positions in optics/optical communications at UCL]
Date: November 28, 2007 10:01:29 AM EST
To: griff@physics.wm.edu

Hi Dr. Griff,

I received the following email at work and thought it might be of interest to undergrads looking at grad school. The positions are in the UK, I think (Belfast and London), so it's probably a long shot that anyone is looking for an opportunity quite like this, but hey--you never know. Just thought I pass it on, in case. Hope you're doing well!

Jen

----- Original Message -----

Subject: Fully-funded PhD positions in optics/optical communications at UCL
Date: Mon, 26 Nov 2007 12:32:04 +0000
From: Polina Bayvel <p.bayvel@ee.ucl.ac.uk>
To: pbayvel@ee.ucl.ac.uk

Dear colleagues

Recent grants have led to several open, fully-funded PhD studentships which we are currently looking to fill. The positions are at the Department of Electronic & Electrical Engineering, UCL in the Optical Networks Group. I would be grateful if you could bring these to the attention of any suitable students considering a PhD. These positions can be taken up at any point, ideally as soon as possible.

Many thanks

Polina Bayvel

We are looking to recruit academically excellent and research-focused students for the following projects, starting in 2008 (at any stage during the year, ideally as soon as possible):

1. Surface plasmon devices for applications in communication and signal processing, EPSRC funded project, in collaboration with the Queen's University of Belfast, under the supervision of Professor Polina Bayvel

Surface plasmon polaritons (SPPs) are electromagnetic waves on a surface of good metals coupled to oscillations of conduction electrons. The surface polariton is intrinsically a two-dimensional excitation, and SPPs can be used to reduce the problem of handling of optical signals from three to two dimensions. This offers an opportunity for signal processing and control using properties of these waves on nanostructured surfaces and thin films. The SPP-based applications can form the basis of a new family of devices for signal processing applications in future multiwavelength optical networks. As these networks evolve towards the nonlinear and quantum limits, new device functionalities to support these network technologies are required, and these devices must be necessarily compact and integrable. It is very appealing if all of these could be implemented as a single compact and integrable device, ideally with some optical gain. The aim of the project is to design such photonic elements for future optical networks underpinned by the properties of surface plasmon polariton waves on nanostructured metal surfaces and thin films. Polarisation and wavelength sensitive applications as well as active devices for amplification of SPP signals will be investigated, for applications in communications and signal processing. The student will be involved in the physics, design and free-space optical characterisation of these devices and with the design of the input/output coupling optics, supported by the fabrication and modelling work of colleagues at Nano-Optics Group, Queen's University of Belfast..

2. Optical frequency transfer using installed fibre networks: collaboration between the Quantum Frequency Standards Group (Dr Stephen Lea), National Physical Laboratory (NPL) and Optical Networks Group, University College London (UCL) (Prof P Bayvel)

Optical frequency standards based on trapped ions or cold atoms are being developed at a handful of National Measurement Institutes around the world, such as the NPL in the UK, as successors to the caesium microwave standard, which at present realises the definition of the second in the SI system of units. Remote frequency comparison techniques are needed to compare these standards one with another and to disseminate frequency and time standards to users. It is unlikely that current time and frequency comparison methods, based on radio-frequency links via satellite, can be optimised to match the expected ultimate stability of optical frequency standards. Transfer of an optical frequency via optical fibre offers the potential of greatly improved performance but is only economically feasible if it can be performed using installed optical fibre networks. This Ph.D project will study the transmission of highly-stable optical frequencies in the laboratory and over an installed fibre network. The effect of noise sources in the optical network will be studied and techniques for their mitigation developed. The project draws on the expertise of the Optical Networks Group at UCL in ultrafast data transmission over optical networks and the expertise of the Quantum Frequency Standards group at NPL in optical frequency standards and metrology. The Ph.D student will be under the academic supervision of Prof Polina Bayvel at UCL and will be based mainly at NPL in Teddington, south-west London, but will perform part of the project using the optical fibre network research facilities at UCL. A student working on this project will gain experience of laser stabilisation, optical fibre physics, optical data transmission, phase noise analysis techniques, and optical frequency metrology, working alongside some of the UK's leading experts in these fields. The student will additionally study issues affecting transmission and dissemination of stable frequencies and wavelengths over large-scale all-optical fibre

networks.

Two further studentships, fully funded, on transmission of absolute frequency standards, **Huawei** – on electronic compensation techniques and new signal modulation formats for 40-160 Gbit/s, and **Azea** – on techniques for optical high-speed transmission using coherent receivers and digital signal processing, are also being set up to start in 2008. Please ask for details about these, if interested.

Applications can be made using the UCL postgraduate study application form, obtainable at <http://www.ucl.ac.uk/prospective-students/graduate-study/application-admission/index.shtml>, Candidates should indicate on the application form under 'Programme of Study' that they are applying for one or more of the studentships above.

Informal inquiries on the studentship topics/practical details can be made to Prof P Bayvel (pbayvel@ee.ucl.ac.uk), tel + 44 (0)207 6797921 to whom also a copy of the application forms should be sent. One set forms should to be directed to the Registry (as per application form).

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