# Fully–funded PhD Studentships – Intelligent Optical Networks enabled by Machine Learning

**Department**: Electronic & Electrical Engineering, University College London

**Closing date:** Applications will be accepted until posts are filled.

**Eligibility**: Home/EU students. Some scholarships for candidates from outside EU may be for academically exceptional candidates ONLY.

## Context

Applications are invited for fully-funded PhD studentships, in the Optical Networks Group, Department of Electronic and Electrical Engineering at University College London (UCL).

The studentships are associated with the £6M, 6-year EPSRC Programme Grant TRANSNET (Transforming networks - building an intelligent optical infrastructure), a research programme grant recently awarded to a team of researchers from UCL, in collaboration with Aston and Cambridge Universities and leading industrial partners. The aim of TRANSNET is to create an adaptive intelligent optical network, that is able to dynamically provide data transmission capacity where and when it is needed – a transformative approach for the next-generation digital communications infrastructure. The group at UCL, is a leading research team integrating machine learning techniques into optical transmission systems and network architectures.

See our recent work in this area at https://arxiv.org/abs/1804.04097

The structure of the programme together with the research themes can be found here:

https://www.ucl.ac.uk/transnet-programme/

## Studentships

The PhD students will be part of a world-leading team working on the design of future, adaptive optical networks and intelligent transceivers. It is envisaged that these will be enabled by machine learning techniques, digital signal processing, advanced modulation formats and coding; all taking account of nonlinear optical channel properties.

Research will focus on the optical networks underpinning the cloud infrastructure – from long-haul submarine networks to the shorter reach data centre and access networks. Some of the overall goals of the programme are to :

- Develop new approaches to the design of network topologies and architectures, tailored to application requirements: throughput, scalability, latency and resilience.
- Quantify fundamental limit to network-wide throughput, in the adaptive network regime, taking into account optical fibre nonlinearities.
- Develop a family of low-complexity intelligent transceivers capable of operating on different time- and distance-scales: overall delay bounded by propagation delay of fibre.

An ideal student for this programme would be motivated to deliver the next generation of optical network infrastructure using new and emerging technologies for optimisation, artificial intelligence/machine learning and optical network design.

The studentships can start at any time and we will continue recruitment on a rolling basis until all positions are filled.  The generous awards, some of which are fully or partially-funded by project partners inc MicrosoftAlcatel Submarine Networks, KDDI Japan and others, will cover UK/EU tuition fees and a tax-free maintenance stipend (including London weighting), currently £16,999 per annum (2018/2019) plus an industrial top-up as well as support for equipment and travel.

Fully-funded industrial studentships may be separately advertised as they arise and details will be available here:

https://www.ucl.ac.uk/electronic-electrical-engineering/about/vacancies

Alternatively, you can apply for the TRANSNET studentships, in general, and you will be informed of all studentships available.

## How to Apply

To make informal inquiries, please send a CV, including a list of any publications, with the contact details of at least two referees to Prof Polina Bayvel (p.bayvel@ucl.ac.uk) who will also be happy to answer any questions about this project.

Students should also complete the UCL online application form for postgraduate admission:

**https://www.ucl.ac.uk/prospective-students/graduate/research-degrees/electronic-electrical-engineering-mphil-phd**

Please clearly mark your application as  : **ONG-TRANSNET**