



PhD : modelling, design and applications of 3D nanoprinter fabricated diffractive photonic nano-structures.

Context and description

The IMT Atlantique is a graduate (“Grande Ecole”) engineering school in information technology and related fields located near Brest in Brittany on France’s Atlantic coast.

The Optics Department of the IMT Atlantique currently has a position vacant for a fully funded three year PhD position to work on recently obtained French National (ANR) and European (H2020) research projects. The successful candidate will contribute to the study, design, fabrication, optimisation and application of diffractive optical elements (DOEs or computer generated holograms) for applications in flexible LED displays, security holograms, flexible opto-electronics, automotive displays and photonic light concentrators. The PhD aims to take advantage of the new possibilities (sub-wavelength resolution, fully 3D nanostructures) offered by the prototype 3D nanoprinter (multi-photon polymerisation, parallel-write) developed in the EU/ANR projects to design and test novel, higher performance diffractive structures and optical effects.

Objectives

To fulfil the tasks assigned to the IMT Atlantique in these projects, the selected candidate’s roles will include:

- design of diffractive optical elements (DOEs) using in-house and commercial (VirtualLab) software
- fabrication of the designed DOEs in the IMT Atlantique Optics Department cleanrooms
- optical characterisation of the DOE performance and iterative optimisation of the DOE design based on the results of the characterisation
- design and fabricate DOEs for industrial and academic project partners
- contribute to the running of the ANR/EU projects: participate in progress meetings, liaison with partners, report writing ...
- disseminate the scientific results (patents, conferences, publications ...).

The candidate should have a strong theoretical and practical background in photonics and will be expected to contribute his/her own innovative ideas to develop new concepts and devices for the targeted applications. The work will be performed in a team with optics department researchers (Profs, PhD students ...) and with external partners, both academic and industrial.

Candidate profile

- Masters or engineering student and with a solid grounding in photonics, physics or electrical engineering,
- Experience of computer programming (C/C++ preferred) and particularly modelling preferred
- Cleanroom and photo-lithography experience would be an advantage
- Taste and aptitude for laboratory experimentation (fabrication) and practical applications.
- Ability to work and write scientific reports and articles in English
- Knowledge of French an advantage but not required initially.

Practical details

Start date : September 2018

Financial conditions : salary of ~1800€ (gross) /month

Applications close : 1st July 2017

Please send candidatures to: Prof. Kevin Heggarty kevin.heggarty@imt-atlantique.fr

Websites : <http://www.imt-atlantique.fr/fr> and <http://www.phenomenonproject.eu/project>