

Spécialité de Master « Optique, Matière, Paris »

Stage de recherche (4 mois minimum, à partir de début mars)

Proposition de stage (**ne pas dépasser 1 page**)

Date de la proposition :

Responsable du stage / internship supervisor:	
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Nom du Laboratoire / laboratory name: Laboratoire de Nanotechnologie et d'Instrumentation Optique (LNIO)	
Code d'identification : Institut Charles Delaunay, CNRS UMR6281	Organisme : Université de Technologie de Troyes (UTT)
Site Internet / web site: http://lnio.utt.fr/fr/index.html	www.quantumnanodevices.com
Adresse / address: 12 rue Marie Curie, 10000 Troyes	
Lieu du stage / internship place: LNIO-UTT	

Titre du stage / internship title: Optical coupling of nanostructures with waveguides
Résumé / summary This project will consist in studying the coupling of light and matter between various types of nanostructures such as nanowires, nanocrystals, nanodiamonds and optical waveguides. This project aims at using a microphotoluminescence experiment for the study of nanostructures. Such an experiment will enable us to study single nanostructures such as a single nanowire or a single nanocrystal. Using a pump laser, we will be able to excite a single nanostructure and then study the spectroscopic properties of such a system. In this project, the microphotoluminescence set-up will have to be able to perform at room temperatures as well as down to liquid helium (5 K). With such an experiment, we will be able to study specific properties of coupled nanostructures such as the coupling of a single nanocrystal with an optical waveguide. Fabrication in our clean room will be necessary in order to insert nanostructures into the waveguides. The waveguides are made of glass where the guiding is realized through a process of ion-exchange giving rise to a waveguiding region. This will be done in collaboration with the photonics company TeemPhotonics based in Grenoble with few visits planned during the internship. This project is mostly experimental but some theory might be involved in the analysis of the spectroscopic results as well as the use of COMSOL for electromagnetic simulation. Key-words: quantum optics, single nanostructures, microphotoluminescence, photonics, waveguide optics. The student will be using a home-made microphotoluminescence set-up designed to address single nanostructures. He will also acquire skills in waveguide optics and integrated optics as well as in nanofabrication using our clean room facilities via the platform Nano'Mat. The project can lead to a PhD funded by the European project LIMQUET (ITN network). The PhD project will be in co-supervision with the company TeemPhotonics and secondments are planned at the University of Oxford (UK) and at the Ecole Polytechnique Fédérale of Lausanne-EPFL (Switzerland).
Toutes les rubriques ci-dessous doivent obligatoirement être remplies

Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : oui	
Si oui, financement de thèse envisagé/ financial support for the PhD: projet européen ITN-Marie Curie, LIMQUET	
Lumière, Matière, Interactions	Lasers, Optique, Matière

Fiche à transmettre (fichier pdf **obligatoirement**) sur le site <http://stages.master-omp.fr>