

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:			
Nom / name:	Lauret	Prénom/ first name :	Jean-Sébastien
Tél :	01 69 35 21 32	Fax :	
Courriel / mail:	lauret@ens-cachan.fr / mailto:jean-sebastien.lauret@lac.u-psud.fr		
Nom du Laboratoire / laboratory name: Laboratoire Aimé Cotton			
Code d'identification :	LAC	Organisme :	
Site Internet / web site:	site de l'équipe , Facebook , Researchgate		
Adresse / address:	bat 505 campus d'Orsay, 91405 Orsay		
Lieu du stage / internship place:	Orsay		

Titre du stage / internship title: Optical spectroscopy of graphene quantum dots and nanoribbons
Résumé / summary <p>In the last few decades, research on semiconductor nanoparticles has developed strongly. Nevertheless, few of them are emitting in the near infrared which is a key point for a large number of applications. For example, photonics on a chip requires sources that emit in the infrared under the gap of semiconductors such as silicon or GaAs. Likewise, biological imaging requires emission wavelengths in the transparency zone of human tissues, typically between 700 nm and 1000 nm.</p> <p>In this context, carbon nanostructures represent an interesting alternative to conventional semiconductors. In order to bring these objects to the forefront of applications, many academic studies are needed. This thesis will focus on the study of the optical properties of graphene quantum dots and nanoribbons. The experiments will be performed at the individual object scale. The intrinsic properties of these objects such as electron-phonon coupling, emission statistics or manybody effects will be probed. Similarly, the effects of the local environment of the nanoobject will also be studied. One example is the study of blinking and spectral diffusion, which give information, through complex statistical processes, on the local electrostatic environment of the object.</p> <p>This thesis will benefit from the collaborations of the team with several groups specialized in the synthesis of these objects by 'bottom-up' chemistry. This point is an important asset as the control of the structure is crucial to have access to the intrinsic properties of the object. To date, the team has samples at the international state of the art.</p> <p>To carry out this thesis, the candidate will use a microphotoluminescence setup coupled to an atomic force microscope. He / she will also carry out experiments at cryogenic temperatures. The candidate must have a good knowledge of optics, quantum mechanics, statistical physics and solid state physics. Finally, this topic is clearly at the interface with chemistry. Depending on the profile and tastes of the candidate, the subject may be fully focused on the physics or include more chemistry.</p>
Toutes les rubriques ci-dessous doivent obligatoirement être remplies

Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : YES			
Si oui, financement de thèse envisagé/ financial support for the PhD: EDOM			
Lumière, Matière, Interactions	X	Lasers, Optique, Matière	X

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