

Spécialité de Master « Optique, Matière, Plasmas »

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

Proposition de stage (ne pas dépasser 1 page)

Date de la proposition : 31/10/2013

Responsable du stage / internship supervisor: Christophe Voisin / Carole Diederichs	
Nom / name: Voisin	Prénom/ first name : Christophe
Tél : 0144323845	Fax : 0144323840
Courriel / mail: christophe.voisin@lpa.ens.fr	
Nom du Laboratoire / laboratory name: Laboratoire Pierre Aigrain (LPA)	
Code d'identification : UMR 8551	Organisme : Laboratoire Pierre Aigrain
Site Internet / web site: www.lpa.ens.fr	
Adresse / address: 24 rue Lhomond, 75005 Paris	
Lieu du stage / internship place: Département de Physique de l'Ecole Normale Supérieure, Paris	

Titre du stage / internship title: Low temperature spectroscopy of WS2 monolayers.
Résumé / summary
<p>Graphene, the first truly two-dimensional material available at low cost has brought considerable breakthroughs in a number of domains ranging from high speed electronics to metrology and many others are to come. However, for some applications such as logical electronics or opto-electronics the lack of a band gap is a real issue. The recent discovery of new layered materials such as BN or metal dichalcogenides (such as WS2) allow to consider very attractive alternatives. Such materials bring the advantage of optical bandgaps that become direct gaps for monolayers and allow a spin control of the excited state through the polarization of the excitation beam, opening the way to optospintronics. In addition, heterostructures combining monolayers of graphene and monolayers of WS2 should allow to build original opto-electronic devices. Since the very recent discovery of this new material, only a few experimental reports established its basic properties but theoretical studies promise much more. The goal of this internship is to explore for the first time the low temperature properties of WS2 monolayers, where the excitonic and spin related properties should be prominent. The study will be carried out in collaboration with a team of Columbia University (NY, USA) that will provide state of the art samples for this study.</p> <p>The student must have a strong background in solid state physics and experimental optics and a strong motivation for experimental work.</p> <p>Methods and techniques: Photon counting spectroscopy, cryogenic techniques, nano-fabrication</p>
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: Allocation de recherche du Ministère de l'Enseignement Supérieur et de la Recherche			
Lasers, Optique, Matière	OUI	Lumière, Matière : Mesures Extrêmes	
Plasmas : de l'espace au laboratoire			

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