

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 : 07/10/14

Responsable du stage / internship supervisor:	
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Nom du Laboratoire / laboratory name: Institut des Nanosciences de Paris	
Code d'identification : UMR 7588	Organisme : CNRS
Site Internet / web site: http://www.insp.jussieu.fr/	
Adresse / address: 4 place Jussieu, 75005 Paris	
Lieu du stage / internship place: tour 22-23-205	

Titre du stage / internship title: Ultra-fast manipulation of magnetization using femtosecond laser pulses in nanometric layers of ferromagnetic semiconductors
Résumé / summary <p>This experimental internship proposes to study the interaction of ultra-fast laser pulses with the magnetization of a promising family of materials: magnetic semiconductors. It will allow the student to develop strong experimental skills using lasers, cryogenics, magneto-optics (dynamic effects and static Kerr imaging) as well as acquire an excellent background of magnetism knowledge.</p> <p>In dilute magnetic semiconductors, the ferromagnetism stems from the exchange interaction between the carriers and the magnetic ions (Mn). This duality makes these materials particularly attractive, as it opens the possibility of using all the experimental techniques developed for semiconductors to investigate their magnetic properties.</p> <p>In particular, ultra-fast light pulses can be used to excite the carriers-magnetic ions system over a few hundreds of femto-second ("pump" pulses), and observe the resulting dynamics of the magnetization ("probe" pulses) such as the magnetization precession depends in a complex manner on the magnetic characteristics of the layers, but also on the polarization, power etc. of the light pulses. Beyond the linear regime of magnetization precession, one can also hope to fully reverse the magnetization with light, as is routinely done in rare-earth based ferrimagnets, but has never been evidenced in out-of-plane magnetized magnetic semiconductors.</p> <p>During this internship, we will study the dynamics of magnetization on nanometric layers of (Ga,Mn)(As,P) or (Ga,Mn)As, analyze the data within various spin-wave theories, and perform micromagnetic simulations.</p> <p>See more information on the group's activity at: http://www.insp.jussieu.fr/Semiconducteurs-magnetiques-dilues.html</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: Ecole Doctorale			
Lasers, Optique, Matière	x	Lumière, Matière, Interactions	x
Plasmas : de l'espace au laboratoire			

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