

Spécialité de Master « Optique, Matière, Plasmas »

Stage de recherche de 6 mois à partir de début mars 2014

Proposition de stage M2 dans le cadre du Labex Plas@Par (ne pas dépasser 1 page)

Date de la proposition :

Responsable du stage / internship supervisor:			
Nom / name:	Riconda	Prénom/ first name :	Caterina
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Nom du Laboratoire / laboratory name: Laboratoire pour l'Utilisation des Lasers Intenses (LULI) Extreme Light Infrastructure -Prague (ELI)			
Code d'identification : LULI UMR 7605 CNRS		Organisme : UPMC-Ecole Polytechnique - CEA	
Site Internet / web site: http://www.luli.polytechnique.fr www.eli-beams.eu			
Adresse / address: LULI Ecole Polytechnique, ELI Fyzikální ústav AV ČR, v.v. i.Na Slovance 2 182 21 Praha 8			
Lieu du stage / internship place: ELI Prague, République Tchèque			

Titre du stage / internship title: **Kinetic simulations of laboratory astrophysics phenomena**

Résumé / summary

The ELI (Extreme Light Infrastructure) Project is an integral part of the European plan to build the next generation of large research facilities. ELI-Beamlines as a cutting edge laser facility is currently being constructed in Prague, Czech Republic; its commissioning is scheduled for end of 2015. ELI will be delivering ultrashort, ultraintense laser pulses lasting typically a few tens of femtoseconds (100 fs) with peak power projected to reach 10 PW. It will make available time synchronized laser beams over wide range intensities for wide range of interdisciplinary applications in physics, medicine, biology, material science etc. The high laser electric field intensities of the laser pulse will be also used for generating secondary sources of e^- and p^+ and high-energy photons.

Nonlinear coherent structures such as solitons, collisionless shocks, vortices and Weibel-type instabilities are ubiquitous phenomena in relativistic astrophysics. Kinetic simulations are the most suitable tool to investigate the many open questions related to the above-mentioned phenomena. The availability of high-intensity, short-pulse laser allow to access new regimes in relativistic laser-plasma interaction which are of relevance to the new research area of laboratory astrophysics. Simulations allow to investigate these nonlinear coherent structures and help to design future experiments. The stagiaire will perform initially 1D kinetic simulations, analyse the data and interpret the physics. Depending on the time available the candidate might also perform some 2D simulations.

The stagiaire should

- Feel comfortable in an international research environment
- Have a good knowledge of English in speaking and writing
- Be interested in simulations using Particle-in-cell (PIC) codes
- Display a decent capability of independence

Scientific contact ELI : Weber Stefan <Stefan.Weber@eli-beams.eu>

Scientific contact UPMC : Caterina.Riconda@upmc.fr

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:

Lasers et matière	x	Lumière, Matière : Mesures Extrêmes	
Optique de la science à la technologie		Plasmas : de l'espace au laboratoire	x

Fiche à transmettre, (en PDF), à partir du 6 octobre 2013 à dorian.zahorski@obspm.fr