Spécialité de Master « Optique, Matière, Plasmas »

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

Proposition de stage

Date de la proposition : 19/12/2014

Responsable du stage / *internship supervisor*:

Nom / *name*: GARRELIE — Prénom/ *first name* : Florence

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Nom du Laboratoire / *laboratory name*: **Laboratoire Hubert Curien**

Code d'identification :UMR CNRS 5516 — Organisme :Université Jean Monnet

Site Internet / *web site*: http://laboratoirehubertcurien.fr/

Adresse / *address:* 18 Rue Pr. B. Lauras, 42000 SAINT ETIENNE

Lieu du stage / *internship place*: SAINT ETIENNE (France)

Titre du stage / *internship title*: Nano-periodic structuring by femtosecond laser

Résumé / *summary*

Subject : The irradiation of a material with ultrashort laser pulses leads to the formation of nano-periodic structures on the surface, also called LIPSS (Laser-Induced Surface Periodic Structures), which are believed to be triggered by the excitation of surface plasmons . Some of these nano-structures have a periodicity of the order of 100 nm, highly dependent on the irradiation conditions and the surface state of the irradiated material. The transitional material properties are poorly understood to date, and we seek to better define the conditions under which a structuration period very much less than the wavelength of the femtosecond laser will grow parallel to the polarization. The aim of the course, mainly experimental, is to conduct a systematic study of the occurrence of these nanoarrays under irradiation, depending on the angle of incidence of the laser for a small number of pulses. Characterization by scanning electron microscopy of the irradiated metal surfaces will be operated. They will be coupled to angular reflectivity measurements on scales of ultrashort time for each polarization (TE and TM). Comparisons with simulations of laser-matter interaction will finally be considered in a second time to complete this survey

Work Environment: The work is at the heart of concerns of Excellence Laboratory Manutech-SISE from University of Lyon-Saint-Etienne, and the equipment of excellence Manutech-USD, located on the same site as Laboratory Hubert Curien. The course will take place in the team "laser-matter interaction" Hubert Curien laboratory, as part of an international ANR project

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***:** A Ministry scholarship from University Jean Monnet of Saint Etienne is requested by the team on the periodic nanostructuring by ultrashort laser. Financial support from the laboratory of excellence is also sought for this thesis.

Lasers, Optique, Matière	**X**	Lumière, Matière, Interactions	**X**
Plasmas : de l'espace au laboratoire			

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