Spécialité de Master « Optique, Matière, Plasmas »

Stage de recherche (4 mois minimum, à partir de début mars 2010)

Proposition de stage pour l'année 2009-2010 (ne pas dépasser 1 page)

Date de la proposition : jeudi 15 octobre 2009

Responsable du stage / *internship supervisor*:

Nom / *name*: Lalanne — Prénom/ *first name* : Philippe

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Nom du Laboratoire / *laboratory name*:

Code d'identification : — Organisme : Institut d'Optique & St Gobain Research

Site Internet / *web site*: http://www.saint-gobain-recherche.com/francais/index.htm

http://www.institutoptique.fr/affiche.jsp?folder=3856bb8d

Lieu du stage / *internship place*: Institut d'Optique, campus Ecole Polytechnique

Titre du stage / *internship title*:

Light emission and scattering by a cloaked quantum dot

Emission et diffusion de la lumière par une boîte quantique recouverte d'une cape d'invisibilité

Résumé / *summary*

Saint-Gobain is one of the world leaders in building materials with a turnover of more than 43 billions € and around 200000 employees worldwide (end 2008). **Naphel** is a research group at the Institut d'Optique specialized in nanophotonics. The scientific project results from a collaboration beatween Saint-Gobain Research and Naphel.

Scientific project :

The objective of this internship is to study 2 very promising scientific fields in optics:

- nano-antennas, which is a new word to describe nano-components that are able to strong local field enhancements;

- optical cloaking, which is the ability of suppress light scattering of small particles. This is usually done by adding thin layers with well chosen materials and thicknesses.

We propose to theoretically study the feasibility of artificial nanostructures showing strong absorption resonances in particular wavelengths (IR or UV for example) and very low scattering cross section at other wavelengths (visible, for example).
This property can be of strong interest for future Saint-Gobain products, since particles with specific properties (mechanical, optical, thermal,…) could be added to a glass surface and made invisible (cloaked).

Our research will start from previous works by Professor Engheta at the University of Pennsylvania on the possibility of cloaking nano-objects by covering them with metallic layers.
Granted internship : ~1100 €/month

To cloak an object means "rendre invisible un objet" in French.

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***: bourse CIFRE de SGR**

Lasers et matière	**x**	Lumière, Matière : Mesures Extrêmes	**x**
Optique de la science à la technologie	**x**	Physique des plasmas	**x**

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