

# Spécialité de Master « Optique, Matière, Paris »

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

## Proposition de stage

Date de la proposition : 24/09/2018

### Responsable du stage / internship supervisor:

Nom / name: Gallas / Boujday Prénom/ first name : Bruno / Souhir  
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### Nom du Laboratoire / laboratory name: INSP - LRS

Code d'identification : UMR7588 / UMR 7197 Organisme : SU / CNRS  
Site Internet / web site: www.insp.upmc.fr/Proprietes-optiques-de,1153.html

Adresse / address: 4 place Jussieu / Paris

Lieu du stage / internship place: INSP & LRS

### Titre du stage / internship title:

**Enhancement of optical activity in metallic nanostructures for the detection of biomolecules.**

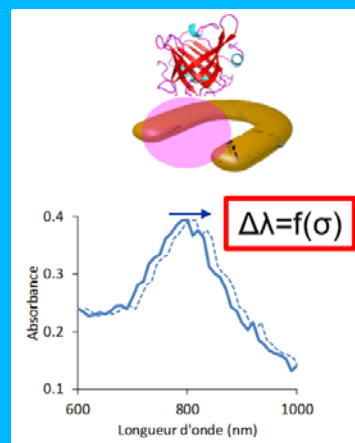
### Résumé / summary

**Introduction :** The enhancement of the optical properties associated with localized surface plasmon resonances in metallic nano-objects find numerous applications in nanophotonics. The fabrication capabilities allow now to elaborate nanostructures with complex shapes and new original properties can be engineered. In particular, it has been shown that resonators exhibiting optical activity may be used to concentrate a chiral local field. This property may be used to exacerbate the sensitivity of detectors to biomolecules based on the measurement of circular dichroism.

With the aim of realizing ultra-sensitive sensors of chiral biomolecules and of monitoring of their activity, we propose in this project to develop : the fabrication of plasmonic functionalized surfaces, the grafting of peptides and proteins and the observation of the radiated electromagnetic field.

**Project :** During the internship, samples will be realized by e-beam lithography in the clean room of the INSP. The functionalization of the samples will be developed at the LRS. The optical properties, in particular the polarimetric properties, of the test molecules coupled with the resonators at the plasmon resonances will be investigated. This will allow probing the strength of the coupling between the resonators and molecules as well as the near-field properties of the resonators.

These results will be the starting point of a larger work leading to the deterministic functionalization with chiral biomolecules and their detection which would be developed during a PhD thesis.



**Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : oui/yes**

**Si oui, financement de thèse envisagé/ financial support for the PhD: ANR**

Lumière, Matière, Interactions

x

Lasers, Optique, Matière

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