

# Spécialité de Master « Optique, Matière, Paris »

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

## Proposition de stage

Date de la proposition :

<b>Responsable du stage / internship supervisor:</b>		
Nom / name: Bonacina	Prénom/ first name : Luigi	
Tél :	Fax :	
Courriel / mail: luigi.bonacina@unige.ch		
<b>Nom du Laboratoire / laboratory name:</b>		
Code d'identification :	Organisme : Université de Genève	
Site Internet / web site: <a href="https://www.unige.ch/gap/biophotonics/">https://www.unige.ch/gap/biophotonics/</a>		
Adresse / address:		
Lieu du stage / internship place: Genève		

<b>Titre du stage / internship title:</b> Estimation of Harmonic Nanoparticles size thanks to non linear microscopy
Résumé / summary
<p>The term Harmonic Nanoparticles (HNPs) designates a family of metal oxide nanocrystals possessing appealing optical properties aside from classical luminescence. In fact, because of the lack of inversion symmetry in their crystal structure, these materials display high nonlinear optical response. In particular, the lowest term of their nonlinear susceptibility, <math>\chi^{(2)}</math>, is non vanishing differently from the case of isotropic materials. For this reason, they are primarily employed in imaging applications based on second harmonic generation (SHG). We have recently shown that third (THG) and even fourth harmonic generation are also very efficient for some of these materials, hence the name.</p> <p>The HNPs are hence promising markers nonlinear microscopy. Their assets in comparison with standard fluorescent markers are their phototunability and their long time photostability. However, all the HNPs have the exact same spectrum of emission, which depends only on the incident electric field. The goal of the internship is to be able to distinguish two different family size of HNPs, looking at the ratio of forward over backward emission.</p> <p>During this internship, you will develop theoretical, experimental and, programming skills. The most useful course from your first semester will be non-linear electromagnetism. You will use Matlab language and work with a ready to use non-linear microscope.</p> <p>The team is young and dynamic. You can ask for help to find an accommodation. Do not hesitate to contact Gabriel Campargue (<a href="mailto:gabriel.campargue@unige.ch">gabriel.campargue@unige.ch</a>) for further information: he is a former student from M2 LOM and will be working with you.</p>
<b>Toutes les rubriques ci-dessous doivent obligatoirement être remplies</b>

Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : maybe

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

Lumière, Matière, Interactions		Lasers, Optique, Matière	
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*Fiche à transmettre (fichier pdf **obligatoirement**) sur le site <http://stages.master-omp.fr>*