

Spécialité de Master « Optique, Matière, Paris »

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

Proposition de stage (ne pas dépasser 1 page)

Date de la proposition :

Responsable du stage / internship supervisor:			
Nom / name:	BON	Prénom/ first name :	Pierre
Tél :	05 5701 7114	Fax :	
Courriel / mail:	Pierre.bon@u-bordeaux.fr		
Nom du Laboratoire / laboratory name:	Laboratoire Photonique Numérique et Nanosciences (LP2N)		
Code d'identification :	UMR5298	Organisme :	Institut d'Optique – CNRS – Univ. Bordeaux
Site Internet / web site:	www.lp2n.fr		
Adresse / address:	Institut d'Optique d'Aquitaine, rue François Mitterrand, 33400 Talence		
Lieu du stage / internship place:	LP2N - Institut d'Optique – Université de Bordeaux		

Titre du stage / internship title: Multicolor 3D SELFI super-resolution microscopy.

Résumé / summary

Over the last decades, single molecule detection and super-resolution microscopy have provided unique details about nanometer organization of complex biological structures in cells[1]. However, until recently, such approaches were not suitable for the study of intact tissue because of the limited brightness of fluorescent emitters, the poor access to molecular probes, confinement the optical aberrations induced by the samples and/or the poor penetration of the light at visible wavelengths. To circumvent these limitations, we recently developed several new approaches [2-4].

One of them relies on a novel paradigm in 3D super-localization microscopy which allows for the first time to achieve 3D super-resolution studies within intact tissues[3]. It is based on creating and analysing self-interference (SELFI) of the point spread function of the microscope.

The primary goal of this internship (followed by PhD) project is to extend the SELFI method to sequential multicolor super-resolution imaging for addressing questions ranging from nanotechnologies to neuroscience. Strategies for extending the depth-of-focus of the SELFI method will also be investigated.

[1] e.g. Heine et al *Science* 320 (2008) 201, see also www.cognet-research.com for other examples from our team.

[2] Varela, et al *Nat. Commun.* 7 (2016) 10947

[3] Godin, et al *Nat. Nanotechnol.* 12 (2017) 238

[4] Bon et al *Nat. Methods*, 15 (2018) 449–454

Toutes les rubriques ci-dessous doivent obligatoirement être remplies

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: available - ANR project

Lumière, Matière, Interactions

Lasers, Optique, Matière

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