

# Spécialité de Master « Optique, Matière, Plasmas »

Stage de recherche (4 mois minimum, à partir de début mars 2012)

Proposition de stage pour l'année 2011-2012 (**ne pas dépasser 1 page**)

Date de la proposition : mardi 3 janvier 2012

<b>Responsable du stage / internship supervisor:</b>	
Nom / name: Monneret Tél : Courriel / mail: <a href="mailto:serge.monneret@fresnel.fr">serge.monneret@fresnel.fr</a>	Prénom/ first name : Serge Fax :
<b>Nom du Laboratoire / laboratory name:</b> Mosaic – Institut Fresnel, CNRS, Marseille	
Code d'identification : Site Internet / web site: <a href="http://www.fresnel.fr/mosaic">www.fresnel.fr/mosaic</a> Adresse / address:  Institut Fresnel, team MOSAIC Domaine Universitaire de Saint Jérôme 13397 Marseille	Organisme :
Lieu du stage / internship place: Institut Fresnel, CNRS, Marseille	

<b>Titre du stage / internship title:</b> <b>Detection of single DNA strands by the combination of phase imaging and optical resonators</b>
Résumé / summary  <b>Scientific context :</b> Recently, our group has developed a quantitative phase microscopy technique aiming at measuring phase distributions of living organisms like individual cells from single shot acquisitions [1]. The basic idea of the system was to plug a wavefront sensor (SID4Bio, Phasics SA, Palaiseau, France) on a microscope to record the distorted wavefront (due to the sample) on its image plane. The current sensitivity of the technique, developed in our group in close collaboration with Phasics Company, is 1 nanometer for the optical path difference between the measured objet and its environment.  <b>Subject :</b> We would like to see now much thinner structures presenting sub-nanometer optical path, as single DNA strands deposited on a substrate. For that purpose, we propose to insert the sample inside a resonator presenting a high quality factor, in order to give us the benefit of the high number of times the light crosses the sample in such a structure. In a first step, the selected applicant will determine the sensitivity of the original technique with respect to the quality factor of the resonator. Then optimization of the system will be performed in order to reach the target application, i.e. detect single DNA strands. This last part of the work should be done with Dr. Erwin Peterman (Vrije Universiteit Amsterdam) who could initiate a formal scientific collaboration with our group in case of successful single DNA detection.  <b>Toutes les rubriques ci-dessous doivent obligatoirement être remplies</b>

<b>Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : non</b>	
<b>Si oui, financement de thèse envisagé/ financial support for the PhD:</b>	
Lasers et matière	Lumière, Matière : Mesures Extrêmes
Optique de la science à la technologie	Plasmas : de l'espace au laboratoire

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