

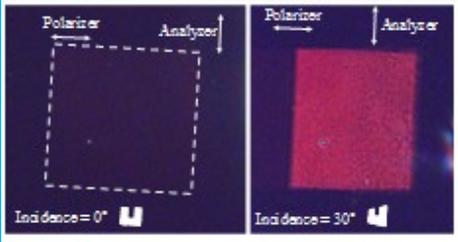
Spécialité de Master « Optique, Matière, Paris »

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

Proposition de stage

Date de la proposition : 22-09-2017

Responsable du stage / internship supervisor:			
Nom / name:	Gallas	Prénom/ first name :	Bruno
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Nom du Laboratoire / laboratory name: Institut des NanoSciences de Paris			
Code d'identification :	UMR 7588	Organisme :	CNRS-UPMC
Site Internet / web site:	http://www.insp.jussieu.fr/-Nanostructures-et-optique-.html		
Adresse / address:	4 place Jussieu – 75005 Paris		
Lieu du stage / internship place:	Tour 22-32-523		

Titre du stage / internship title: Structural colors in circular polarization	
Résumé / summary	
<p>Context : The enhancement of the optical properties associated with localized surface plasmon resonances in metallic objects with dimensions at the nanometric scale (nano-resonators) find numerous applications in nanophotonics. 2D arrays of such nano-resonators are known as metasurfaces. The fabrication capabilities allow now to elaborate nanostructures with complex shapes yielding new original optical properties. In particular there is a strong interest in creating polarized structural colors which may be observable only under particular conditions and would yield anti-counterfeit tags. We have shown recently that 2D resonators could exhibit optical activity [1]. This opens the way to the creation of circularly polarized structural colors.</p>	
<p>Project : During the internship we aim at analyze the polarized colors that can be obtained with metasurfaces. The link between the shape of the nano-resonators and the perceived color in relation with the observation conditions will be established numerically and experimentally. The first part of the internship will be to develop a Matlab code to analyze the polarized colors obtained with the metasurfaces already studied in our group. The second part of the internship will concern the realization of test metasurfaces in the clean room of the INSP using e-beam lithography. The polarization dependent colors will then be measured and compared to the ones calculated in the first part.</p>	
<p>This work may be further developed during a PhD thesis where different polarized images will be intricate along different polarization states. The understanding of microscopic origin of the creation of circular polarization in metasurfaces and of the influence of diffraction will be used to create more vivid colors.</p>	
<p>[1] J. Proust, et al., <i>ACS Photonics</i> 3, 1581-1588 (2016)</p>	
	

Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : oui	
Si oui, financement de thèse envisagé/ financial support for the PhD: ED	

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