



AAP China Scholarship Council - CSC 2024 PROJET DE RECHERCHE DOCTORALE (PRD)

Titre du PRD : Solving Maxwell's equations in photonic nanostructures to fundamentally study light-matter coupling

DIRECTION de THESE

Porteuse ou porteur du projet (*doit être titulaire de l'HDR*) :

NOM : Mivelle

Prénom : Mathieu

Titre : Chargé de recherche CNRS

Section CNU : 30

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Unité de recherche : UMR7588 et Intitulé : Institut des NanoSciences de Paris

Ecole doctorale de rattachement : Physique en île de France

Nombre de doctorants actuellement encadrés : 4 (2 au moment du recrutement)

CO-TUTELLE INTERNATIONALE envisagée : NON

DESCRIPTIF du PRD :

Ce texte sera affiché en ligne à destination des candidates et candidats chinois : il ne doit pas excéder 2 pages doit être rédigé en ANGLAIS

Research proposal

The coupling between light and matter has been known and studied for over a hundred years. However, the emergence of nanofabrication techniques has enabled the development of nanotechnologies, particularly in the field of optics. The coupling of light and matter at the nanoscale has made it possible to enhance interactions with light. This has led to many different applications, from photovoltaics to biology and chemistry.


In our group, we aim to study these interactions at a fundamental level, aiming to understand and explain them. We are focusing, in particular, on the study of interactions between the magnetic component of light and matter, the interplay between chiral light and chiral matter, and the investigation of the magnetization of matter by optical excitation only.

The student recruited will be tasked with optimizing optical nanostructures numerically (by solving Maxwell's equations using a Finite Difference Time Domain method) to study these different couplings fundamentally. Depending on the desired effect, these photonic nanostructures will be metallic or dielectric. The student is expected to demonstrate independence, initiative spirit, strong motivation, and a solid background in physics. A perfect knowledge of English is also required. Please do not apply if these prerequisites are not met.

Although the studies carried out are of a fundamental and theoretical nature, given the innovative character of this research, scientific publications will be aimed at the best scientific journals in the field. For further information, please contact Mathieu Mivelle or visit our website: magneticnanolight.com

AVIS de l'Ecole Doctorale :

Avis favorable



Ecole Doctorale
Physique en Île de France
EDPIF - ED n° 564

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