

## POSTDOCTORAL FELLOWSHIP – UNIVERSITY OF BORDEAUX, FRANCE

### Experimental and theoretical study of the optical properties of nanostructured all-dielectric metamaterial composites

#### Job offer

Recent progress in bottom-up physical chemistry has permitted separating the fabrication of meta-atoms that consist of composite nanomaterials and are synthesized using nanochemistry and colloidal sciences, from the large ensemble assemblies into metamaterials and metasurfaces. It has been shown that meta-atoms with tailored magnetic and electric multipolar resonances could be produced at optical frequencies and their assembly into truly bulk magnetic metamaterials at visible frequencies. In contrast to top-down fabrication, these fabrication techniques enable the production of vast amounts of meta-atoms and as a result, large volumes and surfaces may be produced. The post-doctoral candidate will be integrated in a multidisciplinary team that is part of AMADEus, involving researchers in nanochemistry, self-assembly, soft matter and optics of metamaterials. He or she will assist the team in the design and modelling of optical metamaterials and metasurfaces with applications in high 3D optical magnetism, perfect absorption as well as develop numerical methods mixing electromagnetic and heat transfer calculations for a specific heat management project.

#### Work program

The post-doctoral candidate will have the opportunity to work on the following tasks:

- (i) Design of novel meta-atoms that may be synthesized by nanochemistry with interesting electromagnetic properties such as strong magnetic response, strong forward-scattering or strong infrared absorption.
- (ii) Design of novel metamaterials and metasurfaces composed of meta-atoms designed in step (i) with peculiar ensemble properties such as perfect absorption, strong magnetic permeability or infrared absorption.
- (ii) Analysis and guidance in the interpretation of experimental data measured on nanoparticle suspension and metamaterials.

#### Candidate's profile

PhD with a good publication record as well as good written and oral skills.

Physicist, with a solid background in optics and electromagnetism. A good experience in numerical modelling in optics and heat science is appreciated.

An excellent ability to interact with materials chemists, physical-chemists, theoretical physicists within a multidisciplinary consortium will be essential.

#### Starting date

The post doctorate researcher can start between October and December, 2019, for a duration of 15 months. The position will be kept open until filled. The salary is 2 300 €/month (net)

#### Localization and supervision

The post doctorate researcher will be located in the Centre de Recherche Paul Pascal (CRPP), in Bordeaux, France.

### Application:

The application will include a complete CV and a letter of motivation. Letters of recommendation can be optionally included in a single PDF with the letter of motivation. The application should be written in English and submitted through the Laboratory of Excellence AMADEUS website <http://amadeus.labex.u-bordeaux.fr/en/Jobs/> job opportunity ref: 2019 AMADEus 073.

### Contact:

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