

POSTDOCTORAL FELLOWSHIP – UNIVERSITY OF BORDEAUX, FRANCE

AEROSOL SYNTHESIS OF SILICON NANOPARTICLES FOR OPTICALLY ACTIVE METAMATERIALS

Job offer

Silicon transformed technology in modern society through data treatment, microelectronics and energy production using solar cells. The spectacular performance of electronic devices has been achieved by continuously reducing the size of integrated transistors on a chip to the point that today they have nanometric dimensions. Nanosized transistors are widely considered to be the limit to this technology. Silicon has permitted us go beyond what was previously thought possible in the realm of electronics, and it could perhaps also conquer unexplored domains in optics. Nanosilicon is now being pursued in an attempt to fabricate metamaterials, materials that have properties nonexistent in the natural world. The new optical properties expected from nanosilicon and its composites can be put to application in more efficient solar cells, increased security for watermarks, and to reduce energy loss in telecommunications.

The objective of this study is to create isotropic, crystalline silicon nanoparticles via spray drying. A size sorting procedure will be applied to select particles between 50-250 nm in diameter. The optical properties of these nanoparticles will be studied after dispersion. This dispersion will be processed into thin films and into microchannels for additional optical characterization. The experimental results will be compared with theoretical models to improve the predictive capacities of modeling.

The post doctorate researcher will be integrated into the Chimie des Nanomatériaux group in the ICMCB lab and will participate in the LabEx funded project Metasilicon, which gathers together three academic partners. The post doc will benefit from the synthetic experience of the host team as well as the material fabrication and optical characterization expertise in the project consortium and a partner based in Paris in the LCMCP. The post doctorate researcher will be responsible for the synthesis of silicon particles via spray drying, nanoparticle assembly using dip-coating and microevaporation, and for coordinating the optical characterization of both particles suspended in solution and assembled into a material.

Candidate's profile

For this study, a chemist with spray drying or aerosol experience is needed. Skills working under air-free conditions using a glove box and a Schlenck line and experience in solution processing (e.g. dip-coating, spin-coating, etc.) is desired. Ideally, the candidate will have experience in the following characterization techniques: Ellipsometry, XRD, electron microscopy, porosimetry and optical spectroscopy. A good level of scientific English is required. Candidates who obtained their thesis from Bordeaux or who previously held a post-doc position in the ICMCB will not be considered.

Starting date

The post doctorate researcher can start between February and April, 2018, for a duration of 15 months, with a possible extension of 3 months. The position will be kept open until January 20, 2018.

Salary
2 300 €/month (neto)

Localization and supervision

The post doctorate researcher will be located in the « Institut de Chimie de la Matière Condensée (ICMCB – CNRS UPR 9048) », in Bordeaux, France. This person will be working in the [Chimie des Nanomatériaux team](#). This project will be developed under the supervision of Dr. Glenna Drisko.

Application:

The application will include a complete CV, a letter of motivation, and 2 of the candidate's publications. 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: 2017 AMADEus 064.

Contact:

[Dr. Glenna DRISKO](#)