

Post-doctoral Researcher Position

Self-Assembly of Plasmonic Nanoparticles in Confinement for Sensing Application (NanopiCo)

The NanopiCo project aims at minimizing defects in nanostructures comprising plasmonic (Au, Ag) nanoparticles (NPs) organized into crystalline structures (i.e. supercrystals). Minimizing defects in plasmonic supercrystals is not only a fundamental challenge, but is also relevant for Surface Enhanced Raman Scattering (SERS) spectroscopy. The candidate will achieve a hierarchical organization of gold NPs over large areas (centimeters squared) with micropatterned templates, which will confine the drying of the NP dispersion within specific areas. The nanostructuration will be resolved at the single supercrystal level using an innovative Small Angle X-ray Scattering (SAXS) setup developed on a synchrotron beamline. In short, this technique tackles a technical challenge that is combining high spatial resolution to study individual supercrystals as well as screening the structure of many supercrystals for statistical significance. We expect to optimize supercrystal structuration by adjusting the cross-section of the microcavity with the shape of the NPs constituting the supercrystals. Finally, we will perform a combined SAXS/SERS study on the same supercrystals to correlate the organization of the particles with the SERS response. This work is a prerequisite towards high SERS signal reproducibility and control over the collective plasmonic properties of the system.

Requirement and qualification

The candidate must hold a PhD degree in materials science or physics. A large part of the work will consist in self-assembling NPs by soft lithography and perform SERS experiments to identify promising sample that can be investigated at the synchrotron. Knowledge in SAXS and data analysis will be appreciated. Excellent communication skills (both written and oral) in English are expected while knowledge of French is not mandatory. The candidate must not have more than 5 years of research experience after his/her PhD.

Additional information

The project is funded by the Labex PALM and involves a 24-months full-time contract with forecast starting date in september 2020. The project will take place at the *Laboratoire de Physique des Solides (LPS)* at Paris-Saclay University (Orsay, France) under the supervision of Dr. Cyrille Hamon. Part of the work will be performed on the beamline Swing at SOLEIL synchrotron (in close collaboration with Dr. Thomas Bizien). Salary after tax is fixed to 2200 €/month.

If interested, please e-mail your CV and a brief statement of interest to Dr. Cyrille Hamon at cyrille.hamon@universite-paris-saclay.fr