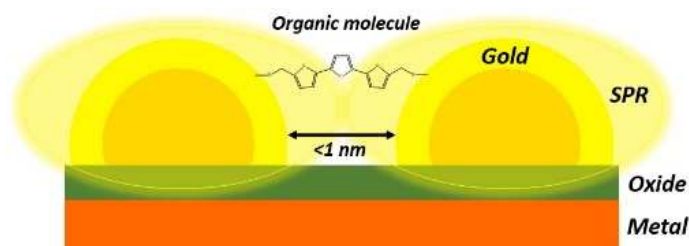


Postdoctoral position in plasmonics for molecular electronics

Controlling the interaction of molecules with metallic nano-contacts on a surface is an important challenge for building stable devices that might conduct electrons through molecules for molecular electronic purposes.

To do so at the ISMO (group of Bernard BOURGUIGNON), we are currently working towards the preparation of hybrid surfaces under ultrahigh vacuum. These consist of a long-range ordered array of core-shell plasmonic nanoparticles (NPs), which are grown epitaxially on an ultrathin oxide layer. Organic molecules link adjacent NPs.



The project LEMON, funded by the French ANR, combines different tools for a multi-domain (space, time, energy) analysis of vibrational, photo-physical and conduction properties of the molecules in relation to structural, electronic and plasmonic properties of NPs.

Under the supervision of Dr. Aimeric OUVARD, the candidate will set up a visible Differential Reflectance Spectroscopy (DRS) experiment, for understanding NP size and composition effects on plasmonic properties and also optical properties and coupling of organic molecules with the NPs. With the help of Rémi LAZZARI (INSP, Paris), the candidate will simulate NP plasmonic response in order to extract geometrical and optical properties of the NPs. This tool will also allow optical characterization of the molecules on NPs and coupling with SPR modes.

Under a collaboration with Fabrice CHARRA (CEA, Saclay), the candidate will conduct STM and photon-STM experiments to characterize NP morphology and plasmonic response with and without molecules. He will focus on the study of SPR strong coupling regime when NP-NP distance becomes shorter than 1 nm. Depending on the overall progress of the project, STM will also allow investigating photon emission from a single molecule following electron injection in the NP or directly into the molecule. The candidate will interact with Abdoul ZAKARIA, a PhD student who is in charge of the growth of these hybrid surfaces and of vibrational spectroscopy study of adsorbed molecules using Sum Frequency Generation (SFG).

The chosen candidate should have solid expertise in plasmonics, and ideally a knowledge of STM technique. Knowledge in optical spectroscopy and/or UHV would be appreciated. He will have a taste for working in a team and be able to manage a PhD student. A one year postdoc contract, starting the 4th of January 2016, is offered with a possible one year extension.

Do not hesitate to contact Aimeric OUVARD for further information (+33 1 69 15 75 27, aimeric.ouvard@u-psud.fr).