



## Coordination complexes grafted on metallic nanoparticles: towards synergy (COCO'sMEN)

### Post.Doc position available at the Parisian Institute of Molecular Chemistry at Sorbonne Université.

#### 1. Abstract of the project

COCOsMEN project aims to develop hybrid nano-objects made from gold or silver nanoparticles on which coordination complexes are grafted. The proposed architecture is foreseen to create a synergy between the localized surface plasmon resonance of the nanoparticles and the optical or electronic properties of the complexes, arising from energy or charge transfer at the hybrid interface. One of the main innovative features of this proposal is the use of N-heterocyclic (NHC) or mesoionic (MIC) carbene functions to bind the complexes onto the nanoparticles surface. These anchoring functions yield strong and covalent C-metal bonds, which should facilitate interactions between the metallic center of the coordination complex and the core of the metal nanoparticle. Systems with Ni(II) or Fe(II/III) complexes will be prepared. With nickel, the possibility to obtain a near infrared emission upon plasmon excitation will be studied. With iron, the possibility to modify the plasmon resonance through the iron oxidation state will be investigated. Time resolved photoluminescence and absorption measurements will be carried out to provide a better understanding of the energy or charge transfers taking place at the hybrid interface. COCOsMEN is a 42 months fundamental research project gathering three academic partners: LCMCP and IPCM, both at Sorbonne University and LOMA at Bordeaux University.

#### 2. Description of the position and profile of the candidates

This one-year postdoctoral fellow will be working jointly with Dr. Sébastien Blanchard ([e-POM team](#)) and Dr. Benoit Fleury ([ERMMES team](#)) at [IPCM](#). Taking advantage of the coordinating site on the carbene anchors at the NP surfaces (whose synthesis is mastered by the [MACO/LCMCP](#) teams), she/he will develop the functionalization of these nanoparticles with Ni(II) and/or Fe(II/III) complexes and perform the characterization (UV-visible spectroscopy, electrochemistry,...) of these hybrids before evaluation of their photophysical properties by LOMA in Bordeaux. A solid background in coordination chemistry (synthesis of complexes, characterization,...) is mandatory, while knowledge in nanoparticles chemistry and electrochemistry would be an asset.

Start of the contract: as soon as possible (N.B.: it takes the administration 8 weeks to set the contract).

#### 3. Contacts

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