

Centre National de la Recherche Scientifique (CNRS)

University of sciences and technologies of Lille, BP 60069, avenue Poincaré,
F-59652 cedex, Villeneuve d'Ascq, France

Post-Doctoral Offer:

Evolving electronic transport in molecular switches / nanoparticles networks

Workplace: Institut d'Electronique, de Microélectronique et de Nanotechnologies (<http://www.iemn.fr>), Lille

Contract Period: 12 months

Remuneration: From 2600 € gross salary per month and depending on the experience

Desired level of education: Ph. D

Experience required: 0 to 4 years

Contacts: Stéphane Lenfant; **e-mail:** stephane.lenfant@iemn.fr; **Phone:** +33 320 19 79 30

Imen Hnid; **e-mail:** imen.hnid@iemn.fr; **Phone :** +33 320 19 79 32

Dominique Vuillaume; **e-mail:** dominique.vuillaume@iemn.fr; **Phone:** +33 320 19 78 66

Web: <http://ncm.iemn.fr>

Work Context:

The EVOLMONET project funded by the National Research Agency over the period 2021-2024 in partnership with chemists of MOLTECH-Anjou, aims to develop nanoparticle-molecule networks with switchable molecules in order to implement reconfigurable reservoir computing hardware. In EVOLMONET, we will explore electron transport at high frequency and dynamics in nanoparticle-molecule networks made of Au nanoparticles functionalized by various types of novel molecular switches building blocks, tailored to exhibit event-driven evolving functionalities. We will address classes of switchable molecular system whose electronic properties are triggered by external stimuli (light, THz electromagnetic field or ionic interactions).

Activities:

The post-doc in the project will participate to: (i) physical and electrical characterizations in AC / DC and terahertz properties using Scanning Probe Microscopes (AFM, Conducting-AFM and interferometric scanning microwave microscope) of molecular junctions formed by grafting of Self-Assembled Monolayer (SAM) of the molecular switch onto flat surfaces; (ii) device fabrication (multi electrodes and nanoparticle-molecule network) using standard lithography techniques in clean room, incorporating the molecular switches synthesized by the partner; (iii) electrical characterizations in AC / DC and in dynamics of the devices.

Skills:

This Post-Doc offer is addressed to a candidate with a strong interest for experimentation and with an experience in scanning probe microscopy (ideally Conducting Atomic Force Microscopy). Skills in materials science (especially SAM), in electronic (especially terahertz) and in lithography technic are an advantage for this offer. For this multidisciplinary subject, at the interface between chemistry, electronic and physics, the candidate will have to manage electrical characterizations, as well as the development of new characterization systems.