



## PhD thesis position available

### *Electron transport in nanocarbon-molecule-nanocarbon junctions*

Our group (Molecular Nanostructures & Devices) - <http://ncm.iemn.univ-lille1.fr> - at the Institut d'Electronique Microelectronique et Nanotechnologie (CNRS & University of Lille) - <http://www.iemn.univ-lille1.fr> - has an open PhD thesis position on **Molecular-Scale Electronics**. The topic is related with the fabrication and measurement of the electron transport properties of nanocarbon-molecule-nanocarbon junctions, where nanocarbon stands for fullerene, carbon nanotube or graphene. The molecule will consist of small  $\pi$ -conjugated oligomers (in a first step) and more sophisticated (or functional) molecules bearing a specific function useful for information technology (e.g. switch, memory, diode...). One of the objectives will be to overcome the drawbacks due to the use of metal nano-electrode as encountered in standard molecular junctions (metal/molecule hetero-interface, limits of the metal nano-gap fabrication, etc...) and to achieve a truly carbon-based nano-electronics.

The studies will deal on the electrical characterization in these molecular junctions, in a large range of temperature (4K-400K), in both static (dc) and dynamic (ac) regimes. More dynamic measurements (admittance spectroscopy in the range 10-100 MHz,  $1/f$  noise, RTS noise, inelastic electron tunneling spectroscopy) will be also carried out to identify and understand the electron transport properties of these molecular junctions.

The group is fully equipped to carry out these electrical measurements. The candidate will benefit to the high-level of equipments at IEMN in nanofabrication (clean-room), nanocharacterization (SPM platform) and the equipments of the group for chemical fabrication of molecular junctions (chemical labs, organic platform with glove-box, etc...). The candidate will be working in a small interdisciplinary group (6 permanent staffs - physicist, chemist and nanodevice specialists; 7 graduate students and post-docs).

We are seeking for a motivated and talented candidate with background in experimental physics and some experience in one of the following topics: solid-state physics, condensed-mater physics, electron transport, electronic nanodevices, STM/AFM, nanofabrication.

The PhD grant is co-funded by the CNRS ("offre INP n°44", see <https://www2.cnrs.fr/DRH/doctorants-09/?pid=4&dptv=4> and <https://www2.cnrs.fr/DRH/doctorants-09/>) and Region Nord Pas-de-Calais.

Starting date: October 1st, 2009, duration: 3 years.

Application deadline : April 24, 2009 (see web site above to download the application form and details on the application procedure).

Candidate should also send a detailed CV, names and e-mail addresses of two/three referees to:  
Dr. D. Vuillaume, IEMN-CNRS, BP60069, avenue Poincaré, 59652 Villeneuve d'Ascq, cedex.

E-mail : [dominique.vuillaume@iemn.univ-lille1.fr](mailto:dominique.vuillaume@iemn.univ-lille1.fr) ; Tel: +33 - 320 19 78 66