The job: A post-doctoral research position is open in the “molecular nanostructures & devices” group of the Institute for Electronics Microelectronics and Nanotechnologies, a CNRS laboratory located at the university of Lille – France. The position is open for one year (renewable one year).

This work is part of a recently launched EU-ICT-FET project aiming to develop synaptic molecular networks for bio-inspired information processing (SYMONE).

The main work program and objectives are briefly described below.

We have recently developed a hybrid nanoparticle (NP)/organic device, called a NOMFET (Nanoparticule Organic Memory Field Effect Transistor), which mimics the behavior of a biological synapse. In particular, this device, belonging to the class of memristive devices, is able to mimic several type of synapse plasticity: the STP (short-term plasticity) and the STDP (spike-timing dependent plasticity). The STDP property has attracted a large interest since it is today widely believed that it is at the origin of unsupervised learning in biological neural networks.

The objectives:
The selected candidate will work with physicists (both experiment and theory), nanotechnologists, and chemists to implement 2D memristic arrays and networks, establish multi-scale electrical connections on them, and to demonstrate bio-inspired functional behaviour in such systems. On the experimental side, the post-doc will develop work with lithographically defined NxN arrays of proven individual memristive elements (NOMFETs), as well as self-assembled nanoparticle (NP) networks (NPSAN) with chemically functionalized NPs. The post-doc researcher will be involved in the detailed characterization and physical understanding of these synaptic devices and networks, and in the development of learning schemes for elementary information processing with such networks.

The candidate: We are seeking for a talented candidate with a PhD in experimental device physics or nanoelectronics or nanotechnologies, with proved experiences and skills in device fabrication and relevant electrical characterizations, both at the device and nanoscale level. Specific skills in organic or molecular devices/electronics will be highly appreciated but not mandatory. The position requires a good autonomy and initiative to work in a multidisciplinary area. Good communication skills in English are also mandatory.
The lab: The “molecular nanostructures & devices” group is mainly interested in the electronic properties of organic nanostructures and molecular-scale electronics devices. The group consists of 6 permanent researchers and 7 PhD students and post-doc researchers. IEMN is a widely recognized nano-technology research centres in France with world-class clean-room equipments, electrical characterization and simulation capabilities, near-field scanning probe platform. Our group is well equipped with a platform for "materials and organic devices", we have a large experience for molecular materials and nano-devices fabrication and characterization. For more details:

To apply:
Applicants should send by e-mail:
A detailed curriculum-vitae, a summary of their research works, a detailed list of publications, conferences, etc…, letters of recommendation.
To: Dominique Vuillaume, research director at CNRS, head of the “molecular nanostructures & devices” group: dominique.vuillaume@iemn.univ-lille1.fr

Position available Jan 1, 2013. Seeking will continue until the position is filled.

Relevant recent publications: