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:

Investigating Spin Selectivity with Scanning Probe Microscopy for Chiral Molecular Electronics

Workplace: Institut d'Electronique, de Microélectronique et de Nanotechnologies (http://www.iemn.fr), Lille, France.
Contract Period: 12 months (renewable for 1 year).
Remuneration: From 3021 € gross salary per month and depending on the experience
Desired level of education: Ph. D
Experience required: 0 to 4 years
Contacts : Dr. Stéphane Lenfant; stephane.lenfant@iemn.fr; **Phone:** +33 320 19 79 30
Dr. Dominique Vuillaume; dominique.vuillaume@iemn.fr; **Phone:** +33 320 19 78 66
Web: https://www.iemn.fr/en/la-recherche/les-groupes/groupe-ncm
Applications must be submitted online at:
https://emploi.cnrs.fr/Offres/CDD/UMR8520-STELEN-012/Default.aspx

Work Context:
The CHIRELECMOL project, funded by the National Research Agency over the period 2025-2029 in partnership with chemists from the University of Rennes (https://anr.fr/Projet-ANR-24-CE09-2208), aims to demonstrate enhanced Chirality Induced Spin Selectivity (CISS) in surface-immobilized organic and organometallic chiral molecules, e.g. based on helicene derivatives. We wish to investigate how the CISS effect can be modified by 1) increasing the chiroptical activity through exciton chirality, 2) modulating the spin transport by varying the spin-orbit (S-O) coupling through diverse organometallic chiral systems, and 3) triggering the CISS effect by lights to achieve addressable functional devices.

Activities:
The postdoctoral researcher in this project will be responsible for: (1) fabricating samples, including self-assembled monolayer (SAM) functionalized surfaces with chiral molecules provided by collaborators; (2) performing structural characterization of the samples using various experimental techniques, such as ellipsometry, X-ray photoelectron spectroscopy (XPS), and UV-visible spectroscopy; (3) carrying out scanning probe microscopy (SPM) characterizations, in particular magnetic conducting AFM (mc-AFM) in air; (4) fabricating devices using standard lithography techniques in a cleanroom, for integrating chiral molecules synthesized by project partners; (5) performing electrical characterization of devices as a function of applied magnetic field and temperature.

Skills:
This postdoctoral position is open to candidates with a strong interest in experimental research and experience in scanning probe microscopy (ideally Conductive AFM). The candidate should be a physicist with a solid background in SPM characterization. Skills in materials science (especially self-assembled monolayers), electronic characterization, and lithography techniques are a plus.
This multidisciplinary project, at the interface of chemistry, electronics, and physics, will require the candidate to perform electrical characterizations by SPM as well as contribute to the development of new characterization systems.

Working Context:
The candidate will be based at IEMN in Villeneuve d'Ascq, France (https://www.iemn.fr/), within the NCM group (https://www.iemn.fr/en/la-recherche/les-groupes/groupe-ncm), under the supervision of Dr Lenfant and Dr. Vuillaume, and will also collaborate closely with other project partners.
The position is located in a sector under the protection of scientific and technical potential (PPST), and therefore requires, in accordance with the regulations, that your arrival is authorized by the competent authority of the MESR.