Université Lille Nord de France

Ecole doctorale régionale Sciences Pour l'Ingénieur
Lille Nord-de-France - 072

Titre Thèse	**Electron transport at the nanoscale in Van der Waals heterostructures**	
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Laboratoire	IEMN	Web : www.iemn.fr
Equipe	Nanostructures, nanoComponants & Molecules (NCM)	Web : nanomol.wordpress.com
	Contrat Doctoral Etablissement	U. Lille
Financement prévu	Oui sur projet	
Acquis	Oui, projet ANR-FNS (France-Suisse)	

Résumé du sujet :

This position is open in the context of a collaborative project funded by the "Agence National de la Recherche" and the "Swiss National Science Foundation". It is a project between our group and the Laboratory "Transport at Nanoscale Interfaces" led by Prof. Michel Calame at EMPA at Dübendorf (near Zurich) : https://www.empa.ch/web/s405. This group develops fundamental understanding in the optoelectronic, thermal and ionic transport properties of low-dimensional materials & devices and transfer this knowledge to applications for biochemical sensing and bioelectronics.

We are looking for a highly motivated PhD student with a master degree in condensed matter physics, materials science, nanoscience or a related discipline and a strong interest for 2D materials, nanofabrication, scanning probe microscopy and interdisciplinary research.

Our main goal with this project is to provide a better fundamental understanding of the interface in hybrid, mixed-dimensional Van der Waals heterostructures with high electronic bandwidth. We will focus on the nanoscale characterization (scanning probe microscope) of the organic/graphene interfaces (barristor device), with device developments towards high performance organic/graphene permeable base vertical transistor.

The position requires a good autonomy and initiative to work in a multidisciplinary environment. Good communication skills (written and oral) in English are also mandatory.

The “molecular nanostructures & devices” group is mainly interested in the electronic properties of organic nanostructures and molecular-scale electronics devices. IEMN is a widely recognized nanotechnology research centers in France with world-class clean-room equipment, 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-device fabrication and characterization.

Applicants should send by e-mail: A detailed curriculum vitae, a letter of motivation, diplomas with transcripts and contact details of two referees to : Dominique Vuillaume, research director at CNRS, head of the “molecular nanostructures & devices” group: dominique.vuillaume@iemn.fr