Université Lille Nord de France
Pôle de Recherche et d'Enseignement Supérieur

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

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| **Titre Thèse** | TMDs based high-frequency devices | |
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| **Financement prévu** | Contrat Doctoral Etablissement | ULille ☐ UPHF ☐ Centrale Lille ☐ Yncrea ☐ |
| | Région – Autre ☐ | Contrat de recherche ☐ Préciser : |
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| **Financement acquis ?** ☒ | Contrats de Recherche ☒ Préciser ***H2020 Flagship Graphene*** | Autre ☐ Préciser |

**Résumé du sujet :**

Two-dimensional (2D) materials are regarded as promising building blocks for future high-frequency electronics, opto-electronics and sensing devices. Despite their exceptional properties, the understanding of their properties and the development of technological processes needed for device production reamins in a very early phase.

The aim of this thesis is to develop novel devices based on stacked two-dimensional materials. Encapsulating and/or combining different 2D-materials is key step towards adding novel functionalities and preserving their intrinsic properties. The candidate will fabricate the 2D based devices in the IEMN state-of-art clean room facilities. After fabrication, she/he will characterize their DC and high-frequency properties in the IEMN high-frequency characterization facility which is fully equipped with HF probe stations (0.1 – 110 GHz). Therefore, this thesis will give the possibility to learn advanced nano-fabrication and electrical characterizations of novel nanodevices.

The future candidate will join the CARBON group. The group is part of the EU project Graphene Flagship and partner of international collaborations (Singapore University NTU, Texas University). The group has already developed a custom-made transfer station for assembling 2D heterostructures layer by layer.