Soutenance de thèse

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"Electronic Properties of Graphene Functionalized with 2D Molecular Assemblies"

Graphene has extraordinary electronic properties because of its zero band gap and linear band structure. However, the lack of a band gap hinders the implementation of graphene in electronic devices. Tuning the graphene band gap by organic molecular building blocks is one of the promising ways to obtain a precise control of the graphene charge carriers.

In this thesis, graphene was prepared by sublimating Si atoms from SiC substrate. Three organic molecules which carry different spin information, Ni- phthalocyanine (NiPc), Pt- tetraphenylporphyrin ($PtTPP(CO_2Me)_4$) and Fe- tetraphenylporphyrin (Fe(TPP)Cl) were used to functionalize graphene. The self- assembly and electronic properties of organic molecules on graphene were studied by Scanning Tunneling Microscopy (STM) and Density Functional Theory (DFT) calculation.

All three molecules form well- ordered square lattice molecular networks on graphene via the van der Waals force, which give rise to the capacitive molecule/ graphene interfaces. The electronic coupling between FeTPP molecules and graphene is stronger than that between NiPc or PtTPP molecules and graphene. This study would shed a dim light on the application of organometallic molecules/graphene interface in spintronic devices.

Vendredi 13 janvier 2017 à 14h00

Bât 210 – Amphi 1 (2ème étage)

Université Paris-Sud, 91405 Orsay Cedex

La soutenance sera suivie d'un pot auquel vous êtes chaleureusement conviés.