

Fundamental properties and applications of molecular thin films

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Invité par Alexandre Giuliani

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Séminaires

Molecular thin films have been identified as promising alternatives to inorganic semiconductors for electronic and optoelectronic applications, such as organic light emitting devices and photovoltaic solar cells. Advantages of such devices would be low cost, chemical and structural flexibility, light weight and biocompatibility. Their semiconducting behaviour is due to the large aromatic ring providing electronic delocalisation, but multiple functionalities can be integrated either within one single molecule, or in complex multilayer heterostructures.

In this talk, basic properties of molecular thin films (monolayer up to a few tens of nm in thickness) and heterostructures will first be reviewed, with particular emphasis on structural templating effects at the organic interfaces. Applications of molecular thin films have usually centred on their semiconducting properties, and some perspectives on organic photovoltaics will also be presented. Organic solar cells suffer from poor exciton diffusion length, and new architectures to maximise charge generation have been developed. More recently, we have focused on the interactions of unpaired spins present in metallorganic derivatives such as metal-phthalocyanines (MPc). The spin is usually carried by a transition metal in the organic cavity and, in an ordered film, MPcs undergo magnetic coupling, which can be tuned depending on the crystal structure. This effect can form the basis of a molecular magnetic switch, offering new perspectives for spintronic applications. Finally, the potential of MPcs as novel routes for doping metals into semiconductors in mild conditions will be presented.

Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi Soleil du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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