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SEMINAIRE ISMO

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Ordered nanotemplate for molecular electronics

One of the current challenges in nanoelectronics is to provide a template for the growth of electrodes at the nanoscale to improve the packing density for higher speed and lower power consumption. Since the early 2000's, several groups have demonstrated long-range ordered nanoparticle (NP) nucleation on several surfaces, like graphene/Ir(111) or ultra-thin Al_2O_3 layer on $\text{Ni}_3\text{Al}(111)$. These nanotemplates can be used as a playground for nanoelectronics, plasmonics and heterogeneous catalysis purposes by using core/shell NPs (plasmonic, magnetic, semiconductor) and organic molecules that functionalize or link NPs.

In this talk, I will present the development and investigation of long-range ordered nanoparticle arrays prior to organic molecule deposition, using a multiscale technique approach (electron diffraction, STM microscopy, vibrational and UV/Vis spectroscopies) that have been developed for this project. The impact of the oxide growth parameters on the long-range ordering of the NP array will be discussed. We determine the monometallic NP geometry and core/shell NP interface quality for NP sizes ranging from several atoms up to coalescence, by using Vibrational Sum Frequency Generation. The plasmonic response of core/shell NPs has been addressed using UV-Vis Differential Reflectivity Spectroscopy by means of core size and shell thickness effects. The interest in using NP and oxide layer electronic properties for nanomemory potential applications will be shown.

Attention :
nouveau
bâtiment

Mardi 7 novembre 2017 à 11h
Amphithéâtre du bât 520 (3^{ème} étage)
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