

CBC SEMINAR ANNOUNCEMENT



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Nanoparticles from Helium Droplets Synthesis: Towards New Materials for Plasmonics and Catalysis

Recently we introduced the helium droplet approach as a novel and versatile method for the synthesis of multi-component nanoparticles, in particular, core@shell nanoparticles, and the formation of nanostructures assembled by the deposition of particles on different substrates. The deposition process is very soft, which allows for a deposition of nanoparticles on ultrathin substrates such as hexagonal boron nitride (h-BN) with a thickness of only a few monolayers [1]. The h-BN substrate is particularly well suited for plasmon spectroscopy of nanoparticles in a scanning transmission electron microscope. For Ag@Au core@shell nanoparticles we show that the helium droplet approach allows to control the spectral position of the localized surface plasmon resonance (LSPR) peak by adjusting the Ag:Au ratio. Bimetallic K-Au nanoparticles are particularly interesting for plasmonics. Employing the helium droplet synthesis approach, the highly reactive potassium can be handled and coated with gold. Plasmonic and catalytic properties are combined in Ag@ZnO particles. Besides many other combinations, we also started to investigate CoO nanoparticles deposited on 10 nm thick silicon nitride, a substrate which enables the investigation of nanoparticles by high-order harmonic generation (HHG) based XUV absorption spectroscopy.

[1] A. Schiffmann *et al.*, J. Appl. Phys. **125**, 023104 (2019).

Date:	9th April 2019 (Tuesday)
Time:	3.00 pm to 4.30pm
Venue:	SPMS Research & Graduate Studies Office Conference Room
Host:	Associate Professor Loh Zhi Heng