JOHANNES KEPLER UNIVERSITÄT LINZ

PHYSIKKOLLOQUIUM

Fachbereich für Physik

Johannes-Kepler-Universität Linz

Im Rahmen des Physikkolloquiums spricht

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über

On-surface synthesis and single-molecule magnets

Abstract:

Due to their huge variability and flexibility organic molecular nanostructures on surfaces are of interest for prospective applications ranging from nanoscale electronics and solar cells to energy or data storage devices. One challenge is the creation of these structures on the surface: Especially for more complex molecules standard UHV methods such as thermal evaporation can lead to unwanted modifications of the adsorbate. This problem can be overcome by on-surface synthesis from smaller building blocks, using carefully chosen preparation parameters to obtain the desired properties. The first part of the presentation is dedicated to an example of in vacuo metallation of tetrapyrrole molecules, which is a convenient way to build tetrapyrrole-based metal-organic structures on metal surfaces. We use this technique for the synthesis of rare earth tetrapyrrole double deckers, which are characterized using X-ray emission and absorption spectroscopy methods (XPS, NEXAFS, XMCD) to probe electronic and magnetic properties and scanning tunneling microscopy (STM) to analyse the ordering of the molecules. Another challenge is the modification of the molecules by adsorption onto a substrate. The interaction between single-molecule magnets and the surface can lead to a quenching of the magnetic properties due to a multitude of different effects (e.g., hybridization with the surface, interactions with phonons). The second part of the presentation discusses these effects for the single-molecule magnet terbium phthalocyanine double decker and will show an example of how a thin magnesium oxide layer between the molecules and a metal substrate considerably improves the magnetic remanence of the system.

Datum: Do, 12.01.2017 **Zeit: 17:15 Uhr** **Ort: HS 8**