TECHNISCHE UNIVERSITÄT
CHEMNITZ

Institut für Physik
Physikalisches Kolloquium

Mittwoch, 19.04.2017, um **16:00 Uhr**
Ort: Reichenhainer Str. 90;
Zentrales Hörsaal- und Seminargebäude,
Raum 2/N013

Dr. Pavel Jelinek
Institute of Physics
Czech Academy of Sciences, Prag

Exploring functionalities of single molecules on surface by scanning probe microscopy

The field of molecular electronics aims at using a single molecule as building block for electronic devices. In this talk we will discuss different functionalities of molecules on surfaces investigated by means of scanning tunneling microscopy. First, we will present experimental evidence of controlling multiple charge states on a single 3,6,3‘,6‘-tetraferrocene-9,9’bis-fluorenylidene, deposited on thin insulating NaCl film, by means of nc-AFM. We succeed to control the multiple charge states including their reversible transfer within a single molecule between different redox states. The induced charged states have prominent fingerprints in both the frequency shift and dissipation channels. Moreover, we demonstrate that the charge states can be modified by presence of neighboring charged molecules.

In second, we will discuss large converse piezoelectric effect observed in a single heptahelicene-derived molecule deposited on the Ag(111). The force-distance spectroscopy acquired over a wide range of bias voltages reveals a linear shift of the tip-sample distance, at which the contact between the molecule and tip apex is established. We demonstrate that this effect is caused by the bias-induced deformation of the spring-like scaffold of the helical polyaromatic molecules.

The experimental evidences are corroborated with a theoretical model simulating response of a dynamically oscillating AFM probe to temporal changes of force due to the charging effects of molecules on surface.

Alle Zuhörer sind ab 15:45 zu Kaffee und Tee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt:
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