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S E M I N A R
aus
Halbleiterphysik und Nanotechnologie

Gemeinsames Seminar:
Institut für Physik und Lehrstuhl Aufbereitung und Veredlung

Di, 27.11.2012, 11:15 Uhr
Hörsaal für Physik

"The phenomenon of contact charging - fundamentals and applications"

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The phenomenon of contact charging is the oldest from of electricity, mentioned around 2600 years ago by Thales from Milet for the first time. Although this effect is known for many years and often used in industrial applications, e.g. mining of salts or recycling of plastics, only little is known about the atomic mechanisms how the charge is transferred in between insulting materials when brought into contact.

In this talk I will discuss an atomistic model of this effect which we derived from the charging phenomenon in between wide band gap insulators. The relevant industrial parameters like milling process, grain size, conditioning with organic acids, relative humidity, etc. have been mapped successfully onto well defined surface structures, e.g. epitaxial NaCl and KCl films, using well-established concepts of surface science. The adsorbate induced modifications of the electronic band structure under explicit consideration of characteristic defects like atomic steps and anion vacancies have been investigated by means of UPS and EELS supplemented by ab-inito calculations. The detailed analysis of various molecules adsorbed on these surfaces has finally enabled us to derive a model which can even predict the conditioning yield for other molecules correctly.