

O 1 Invited talk Kumpf

Time: Monday 09:30–10:15

Room: TRE Phys

Invited Talk

O 1.1 Mon 09:30 TRE Phys

Structure defines the nanoworld: Thin films, surfaces and nanoparticles — •CHRISTIAN KUMPF — Exp. Physik II, Univ. Würzburg

Nano-scaled systems like ultra-thin films, surfaces and nanoparticles dominate several fields of modern physics. In many cases it is possible to deliberately tune and hence design the properties of these systems. A detailed knowledge about their geometric structure is essential since this represents the key for a fundamental understanding of the optical, electronic or magnetic properties. In this contribution several examples of structural investigations of unconventional systems are presented, which are based on results obtained from modern diffraction techniques:

Thin films of magnetic half-metallic materials epitaxially grown on semiconductor surfaces are discussed as candidates for spin injection. The degree of spin polarization depends strongly on the quality of the interfaces and layers. These properties are investigated for pseudomorphically strained layers of the half-Heusler compound NiMnSb.

The second example is the adsorption of large organic molecules on metal surfaces. The molecules were believed to be only weakly bonded, however, recently an increasing number of evidences for strong chemisorption was found. We report on x-ray standing waves (XSW) and LEED-IV measurements on NTCDA and Sn-phthalocyanine on Ag(111).

Finally we report on a new approach for the structural analysis of very small ($< 5\text{nm}$) nanoparticles based on synchrotron radiation diffraction data. In contrast to conventional methods our approach enables the investigation of detailed structural parameters like size-distributions, shape, relaxation, stacking faults and other lattice imperfections.