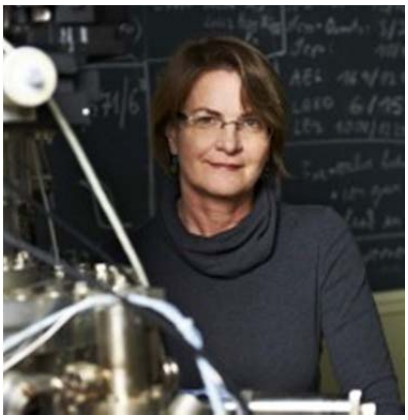
NANOSCIENCE COLLOQUIUM

Thursday March 27th 2014 at 15:15, K-space, Fysicum

Oxide Surfaces at the Atomic Scale

Prof. Ulrike Diebold

Institute of Applied Physics, TU Vienna, Austria



Surface science studies of metal oxides have experienced a rapid growth. The reasons for this increasing interest are quite clear: after all, most metals are oxidized under ambient conditions, so in many instances it is the oxidized surface that deserves our attention. In addition, bulk metal oxides exhibit an extremely wide variability in their physical and chemical properties. These are exploited in established and emerging technologies such as catalysis, gas sensing, and energy conversion schemes, where surfaces and interfaces play a central role in device functioning. Hence a more complete understanding of metal oxide surfaces is desirable from both a fundamental and applied points of view.

By using Scanning Tunneling Microscopy measurements, in combination with Density Functional Theory calculations and area-averaging spectroscopic techniques, great strides have been made in understanding the atomic-scale properties of the surfaces of several oxide materials. In the talk I will give examples drawn from recent studies [1-4] of bulk single crystals including TiO_2 and Fe_3O_4.

[1] Philipp Scheiber et al. Physical Review Letters, 105 (2010) 216101, Physical Review Letters, 109 (2012) 136103

[2] Martin Setvin et al., Science, 341 (2013) 988

[3] Zbyněk Novotný et al., Physical Review Letters, 108 (2012) 216103

[4] Gareth S. Parkinson, et al. Nature Materials, 12 (2013) 724 - 728

.

Host: Edvin Lundgren (Synchrotron Radiation Research)

This is one in a regular series of Nanoscience Colloquia, aimed at all researchers and students with an interest in nanoscience. The series is arranged by the Strategic Research Environment "The Nanometer Structure Consortium at Lund University" (nmC@LU) and by the Linnaeus environment "Nanoscience and Quantum Engineering", funded by the Swedish Research Council (VR).

Vetenskapsrådet