# O 93: Overview Talk (Wolf Widdra)

Time: Friday 9:30–10:15 Location: HE 101

**Invited Talk** O 93.1 Fri 9:30 HE 101

**Ternary oxides: New surfaces structures and surprising interface properties** — •Wolf Widdra — Institute of Physics, Martin-Luther-Universität Halle-Wittenberg, Halle, Germany — Max-Planck-Institut für Mikrostrukturphysik, Halle, Germany

Oxide heterostructures are a novel materials class with a variety of applications. In the easiest cases, the bulk properties define the thin film characteristics. However, oxide interfaces and surfaces can add interesting new concepts and properties. This will be shown here for barium titanate (BTO), a well-studied material in the class of ferroelectric perovskites. For BTO(001) single-crystal surfaces and well-ordered (001)-oriented thin films, the surface-specific ferroelectric properties will be discussed as determined by photoemission electron microscopy and in-situ piezo-force microscopy [1]. A dynamic coupling of the dipolar response with phonons leads to surface-specific phonon-polaritons dominating high-resolution electron energy loss spectra. The characteristic phonon frequencies can identify different oxide phases and different film strain for epitaxial films due to lattice mismatch for different substrates. However, the frustration between cubic BTO and a threefold substrate can also lead to fully new materials: On Pt(111), BTO forms a two-dimensional oxide quasicrystal that is characterized by a brilliant 12-fold diffraction pattern with atomic tiling pattern of triangular, quadratic and rhombic elements [2].

[1] A. Höfer et al., Phys. Rev. Lett. 108, 087602(2012).
[2] S. Förster et al., Nature 502, 215 (2013).