

## MM 16 Invited talk Lehmann

Time: Tuesday 14:00–14:30

Room: IFW A

**Invited Talk**

MM 16.1 Tue 14:00 IFW A

**Electron Holography - New Possibilities for Materials Characterization with (sub-)nanometer Resolution** — ●MICHAEL LEHMANN — Triebenberg Laboratory and Institute of Structure Physics (ISP), Dresden University, 01062 Dresden, Germany

The macroscopic properties of modern materials and nanostructured systems depend on their microscopic structure. Transmission Electron Microscopy (TEM) allows the characterization of these systems with atomic resolution at highest sensitivity. However, important structure details like e.g. electric potentials and magnetic fields are encoded in the phase of the electron wave not recorded by conventional TEM. This *phase contrast problem of imaging* is solved by electron holography, i.e. by recording an interference pattern (“electron hologram”) in the TEM. By numerical reconstruction, the complete information is available in amplitude and phase. From the phase image, magnetic fields can be measured on a mesoscopic scale (10 .. 500 nm); electric potentials and ferroelectric polarization are also accessible at atomic resolution, where even single Au-atoms can be localized after numerical aberration correction.