



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Institut für Physik Physikalisches Kolloquium



Mittwoch, 28.11.2018, um 16:00 Uhr

Ort: Reichenhainer Str. 90;
Zentrales Hörsaal- und Seminargebäude,
Raum 2/N013

Dr. Matthias Zschornak

TU Bergakademie Freiberg und Helmholtz-Zentrum Dresden-Rossendorf

Breaking Crystalline Symmetries – The Local Electronic Structure

The formation of crystals and symmetry on the atomic scale has persistently attracted scientists through the ages. The structural symmetry itself depends in this respect subtly on boundary conditions such as defects or external physical fields. In particular sensitive details in the electronic structure determine the nature of a vast diversity of symmetry-related phenomena – among them piezoelectricity, pyroelectricity, and ferroelectricity. Owing to their versatile orbital character, especially transition metal oxides span the range of ionic, covalent and metallic bonding and thus offer both local and highly dispersive degrees of freedom.

In the talk, crystalline symmetry reductions due to structural defects and external electric fields will be discussed, exemplarily for the quasi-binary system SrO – TiO₂ with the central perovskite SrTiO₃. To gain a thorough physical understanding of the underlying processes, interactions and dynamics, details of the local atomic and electronic structure are accessed by means of experimental Resonant X-ray Scattering methods as well as electronic structure modeling. Based on the variability of X-ray photon energy at synchrotrons, new respective approaches are presented with unique capabilities to increase the contrast for the characterization of subtle structure deviations and a positional precision below the picometer.

Alle Zuhörer sind ab 15:45 zu Kaffee und Tee vor dem Hörsaal eingeladen.



Informationen zum Vortrag erteilt:
Prof. Dr. Sibylle Gemming, Tel. 0351 260 2470

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