

Materials Science and Technology Division

# **“Electrical control of the magnetic state of Fe”**

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**MPI Halle, Halle, Germany**

Monday, March 28, 2011  
2:00 p.m.  
4515/HTML, Room 265

## **Abstract**

Because of low dimensionality and symmetry breaking thin films exhibit electronic and magnetic properties which are considerably distinct from bulk materials and heterostructures. Under an applied electric field, these properties experience a significant structural change which can be traced with both experimental and theoretical methods. In my talk I shall discuss several aspects of these effects, in particular concentrating on the magnetoelectric coupling in low dimensional multiferroic systems and thin metallic films. In the first part of my talk I shall present the method, which we used for this study. The presented results are based on the multiple scattering theory which provides explicitly the Green function, which can be used in many applications such as spectroscopy, transport and many body physics. Combined with the coherent potential approximation this method can be used as well for the description of alloys and pseudoalloys. In second part of my talk, I shall discuss structural, magnetic and electronic properties of iron and cobalt thin films on ferroelectric BaTiO<sub>3</sub> substrate. Then, I shall present a combined theoretical and experimental study of magnetoelectric coupling at the surface of metallic ferromagnets induced by screening charges.

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