

# SFB 608

## Einladung zum Kolloquium

**Ort:** Universität zu Köln  
II. Physikalisches Institut, Seminarraum 201

**Zeit:** 28.02.2007, 14:30 Uhr

**Sprecher:** Stephen Rowley  
Quantum Matter Group Cavendish Laboratory  
University of Cambridge

**Thema:** Ferroelectrics close to quantum criticality

Materials tuned to the neighbourhood of a zero temperature phase transition often show the emergence of novel quantum phenomena. Much of the effort to study these new emergent effects, like the break down of the conventional Fermi-liquid theory of metals has been focused in narrow band electronic systems. Ferroelectric crystals provide another class of materials in which to study quantum criticality and its resulting effects. In many cases the ferroelectric phase can be tuned to absolute zero using hydrostatic pressure. Close to such a zero temperature phase transition, the dielectric constant changes into a radically different form due to the fluctuations experienced in this region. We present new low temperature data demonstrating these effects in SrTi<sub>16</sub>O<sub>3</sub> and SrTi<sub>18</sub>O<sub>3</sub>. Looking to the future, we imagine that quantum paraelectric fluctuations may lead to new low temperature phases and mediate novel interactions in crystals supporting itinerant electrons.

Gez. Prof. M. Abd-Elmeguid