

# EINLADUNG

zum Vortrag  
von

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**Electrical properties of grain boundaries in electroceramics:  
n-conducting BaTiO<sub>3</sub> as a model system**

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**Montag, 17. Juni 2013 um 11:00**

Technische Universität Wien, Fakultät für Technische Chemie

Lehartrakt, Seminarraum Lehar EG, Erdgeschoss

1060 Wien, Getreidemarkt 9

## **Abstract:**

Electroceramic materials are of tremendous technological importance with wide-spread applications. Especially in the case of interfacially-controlled electroceramics, such as ZnO-based varistors and n-type BaTiO<sub>3</sub>-based PTCRs (positive temperature coefficient of resistivity), a sound understanding of the electrical properties of grain boundaries plays a crucial role for the optimization of the functionality of these high performance materials. Moreover, donor doped barium titanate represents an interesting model system for the investigation of the fundamentals of the transport phenomena at grain boundaries which are governed by the formation of strongly blocking space charge layers (Schottky barriers). The transport of charge carriers across these depletion zones is affected by the local composition of grain boundaries (segregation of dopants), temperature, oxygen partial pressure, and the voltage load (voltage drop across the barrier). The relationship between these factors and the electrical properties of grain boundaries will be presented in detail. A double Schottky barrier model has been developed recently which enables the calculation of the grain boundary resistivities as a function of temperature and voltage load as well as a phenomenological interpretation of the PTC effect (steep increase of the resistivity by many orders of magnitude above the Curie-temperature).

**FWF SFB F45 „Functional Oxide Surfaces and Interfaces (FOXSI)“**

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