

# PHYSIKALISCHES KOLLOQUIUM

Mittwoch, den 14.12.2011, um 17:15

Reichenhainer Str. 90, Neues Hörsaalgebäude, Raum: 2/N013

## Defect-induced magnetic order in non-magnetic oxides



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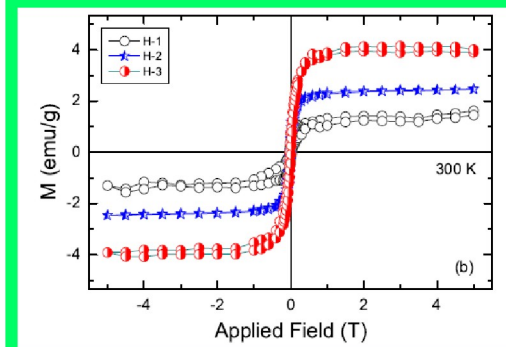
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Covalently bonded oxides, like ZnO, MgO, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, SrTiO<sub>3</sub>, among others, are thought to be “non-magnetic”. The term “non-magnetic” means actually that they are expected to show only a diamagnetic response when a magnetic field is applied. Experimental results of the last years, however, indicate that this is not quite correct. After the failure to obtain reproducible ferromagnetism through doping with transition-metals and rare-earth ions in some of the oxides listed above, scientists started to realize that the influence of defects (like vacancies or non-magnetic ad-atoms) on triggering magnetic order might be non-negligible, like in the case of graphite, the paradigm for what is called nowadays “defect-induced magnetism”. In my talk I will review and discuss experimental evidence that supports the existence of defect-induced magnetic order in non-magnetic oxides, the main theoretical concepts and results used to explain this phenomenon, the open questions as well as the vision we have for the near future.

### Keywords:

Oxides, lattice defects, magnetic order, diluted magnetic

Alle Zuhörer sind ab 17:00 Uhr zum Kaffee vor dem Hörsaal eingeladen.



Ferromagnetic-like magnetization of a pure ZnO single crystal with 10 nm surface region doped with ~ 1%, 2% and 3% protons (H-1, H-2 and H-3) at room temperature.

Khalid et al., New JoP 13 (2011) 063017