



Institutskolloquium

Am Freitag, 25. Januar 2008 um 16:00 Uhr spricht

Prof. Dr. Manfred Fiebig
Helmholtz-Institut für Strahlen- und Kernphysik,
Universität Bonn

über

“Investigation of strong electronic correlations by nonlinear optics”

Abstract: The interplay of spin, orbital, charge, and lattice degrees of freedom in the so-called “strongly correlated systems” leads to a variety of effects that are interesting from the point of view of fundamental physics as well as device applications. Examples include colossal magnetoresistance, magnetoelectric correlations in multiferroics, Mott insulator-metal transitions, and high-temperature superconductivity. In my talk I will show that nonlinear optics (in particular: second harmonic generation) is an ideal tool for investigating the origin and competition of such strong correlations. First, it allows one to study the (di)electric as well as the magnetic properties with the same experimental setup. Second, nonlinear optics is particularly useful for the investigation of the antiferromagnetic state which is the state most frequently found in strongly correlated systems. Third, temporal resolution allows us to investigate the dynamical aspects of the strong correlations with sub-picosecond resolution. Applications I will discuss are the observation of ferrotoroidicity as a new type of ferroic order found in multiferroics, the difference in the magnetization dynamics of ferromagnetic and antiferromagnetic compounds, and novel routes towards ferroelectricity in strongly correlated systems.

**Ort: Max-Born-Saal,
MBI, Max-Born-Str. 2a**

Prof. Dr. Th. Elsässer