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Guest Lecture

"Low-Lying Excitations in the Orbitally Active A-Site Spinels $FeSc_2S_4$, $FeCr_2O_4$ and $FeCr_2S_4$"

Speaker: Joachim Deisenhofer

Address: Institute of Physics, University of Augsburg, Germany

Date: Friday, 4th of December 2015
Time: 2:00 pm
Place: Seminar Room CBEG02 (387, Photonics); Gußhausstraße 27

Abstract: The spinel systems $FeSc_2S_4$, $FeCr_2O_4$, and $FeCr_2S_4$ show cubic symmetry at ambient conditions, but they reveal very different magnetic ground states at low temperatures. $FeSc_2S_4$ does not reveal any structural transition below room temperature, but forms a *spin-orbital liquid* state. In $FeCr_2S_4$ a long-range ferromagnetic order is followed by an incommensurate magnetic structure. Finally, a multiferroic state with orbital order is reached. Similar magnetic structures occur in $FeCr_2O_4$, but a tetragonal distortion precedes magnetic ordering and indicates a stronger Jahn-Teller coupling than in $FeCr_2S_4$. These different states are tracked and discussed via optical excitations of the low-lying electronic states of the Fe^{2+} ions using THz- and FIR-spectroscopy.