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## Guest Lecture

**Title:** "Electron Spin Resonance in Correlated Matter"

**Speaker:** Dr. Hans-Albrecht Krug von Nidda

**Address:** Institute of Physics, Augsburg University, Germany

**Date:** Friday, 17<sup>th</sup> of October 2014

**Time:** 14:30

**Place:** Seminar Room CBEG02 (387, Photonics); Gußhausstraße 27

### **Abstract:**

After an introduction into the basics of electron spin resonance (ESR) spectroscopy, the focus will be on its applications for the experimental investigation of local electronic and magnetic properties in materials with strong electronic correlations.

ESR measures the microwave absorption of a magnetic sample dependent on an external static magnetic field, where the transverse magnetic microwave field induces magnetic dipolar transitions between the Zeeman-energy levels of the electron spins. The intensity of the ESR line is a direct measure of the spin susceptibility. The resonance field provides information on internal fields. The line width is determined by the spin-spin relaxation depending on local anisotropic interactions. These properties allow to draw conclusions about the local environment of the resonant spins.



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In many cases the electron spin, which is relevant for the physical properties of a correlated material under consideration, can be directly detected by ESR. Examples of recent research will be presented as there are the characterization of the orbital order in manganites, the evidence for magnetic vortices in layered antiferromagnets and the accessibility of the electronic density of states in iron-based superconductors.