



# TRR 80 Seminar

Am Dienstag, den 17. April um 16:00 Uhr

spricht

## Dr. Peter Wahl

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über das Thema

### *Tunneling Spectroscopy of Correlated Electron Systems: From two impurity Kondo physics to bulk correlated electron materials*

The properties of correlated electron materials are often attributed to the delicate balance between screening of localized spins and magnetic ordering due to exchange interaction between neighboring spins. Depending on which interaction dominates, the properties of a material can vary between antiferromagnetic ordering and heavy fermion behaviour, between being an insulator or a metal. Certain materials can be tuned at low temperatures between the aforementioned phases through a quantum phase transition as a function of a continuous external parameter, such as doping, pressure or magnetic field. It turns out that theoretically, a simple model system for a quantum phase transition consists of only two magnetic impurities coupled to a bath of conduction electrons. I discuss experimental realizations of the two-impurity Kondo system in low temperature scanning tunneling microscopy. The two-impurity Kondo problem can be considered a model system for correlated electron materials, exhibiting a very similar phase diagram as many bulk materials.

In the second part of my talk, I will show first results obtained by spectroscopic imaging scanning tunneling microscopy characterizing iron chalcogenide superconductors. The spectroscopic data reveal significant spatial inhomogeneity of the superconducting gap. Analysis of spatial modulations of the electronic excitations reveal a clear anisotropy, which cannot be explained from the known symmetries of the crystal structure. The relation to superconductivity and to other iron-based superconductors is discussed.

Gäste sind herzlich willkommen!

Der Vortrag findet im Seminarraum 288/Physik-Süd, Universität Augsburg statt.

Gastgeber: Dr. Joachim Deisenhofer

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