

SFB 608

Einladung zum Kolloquium

Ort: Universität zu Köln
II. Physikalisches Institut, Seminarraum 201

Zeit: Mittwoch, den 16.04.03, 15 Uhr c.t.

Sprecher: Prof. Hans Kroha, Universität Bonn

Thema: Non-equilibrium transport and phase relaxation in diffusive quantum wires with Kondo impurities.

Combining non-equilibrium transport with spectroscopic measurements provides a unique tool for the investigation of microscopic processes in mesoscopic conductors. Experiments on resistive quantum wires show that the non-equilibrium quasiparticle distribution function $f(E, V)$ as a function of the quasiparticle energy E obeys the scaling property, $f(E, V) = f(E/V)$, if the transport voltage V exceeds a certain crossover scale V^* . This scaling indicates anomalous inelastic relaxation processes to be present. It is demonstrated that the latter can be induced by quantum impurities with a degenerate internal degree of freedom, i.e. by Kondo impurities. We review the theory of the Kondo effect in stationary non-equilibrium as well as in a magnetic field, and show that the experiments are explained in detail by a very low concentration of Kondo impurities, with $V^* = T_K$, the Kondo temperature. It is discussed how this provides a possible explanation of the observed low-temperature plateau of the decoherence time in mesoscopic conductors.

Gez. Prof. A. Freimuth