



TRR 80 Seminar

Am Dienstag, den 10. Januar um 16:00 Uhr

spricht

M. Sc. Christoph Wetli

Department of Materials, ETH Zurich

über das Thema

***Coherent emergence of a strongly correlated groundstate
in a quantum critical heavy-fermion system***

One of the most successful paradigms of many-body physics is the concept of quasiparticles. In heavy-fermion metals the quasiparticles have an outstandingly long lifetime. However, near a quantum phase transition, they may disintegrate as the particle concept breaks down. The reasons and conditions for a non-Fermi liquid behavior are intensely debated. In my talk I will present a time-resolved experiment, supported by many-body calculations, which shows how quasiparticles emerge out of a carefully prepared non-equilibrium state. Thanks to the non-ionizing nature of Terahertz radiation, the quasiparticles can be coherently excited as light electrons into the conduction band. Therefore, the formation dynamics of the strongly correlated groundstate can be directly observed.

In the quantum critical $\text{CeCu}_{5.9}\text{Au}_{0.1}$ compound, the heavy-fermion state reconvenes after 5.8 ps under the emission of a temporally delayed, yet phase-coherent reflex. The timescale is defined by the inverse Kondo temperature, which pinpoints the dynamics of strongly correlated systems. At sufficiently low temperatures, the changing dynamics indicates the emergence of the unconventional quantum critical state. The quasiparticle weight collapses while the Kondo impurity temperature is reduced but definitely remains finite.

Gäste sind herzlich willkommen!

Der Vortrag findet im Seminarraum S-288, Institut für Physik, Universität Augsburg statt.

Gastgeber: Prof. Dr. Philipp Gegenwart
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