TRR 80 Seminar

Am Dienstag, den 8. April um 16:00 Uhr

spricht

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über das Thema

Selective Mottness as a Compass in the Phase Diagram of Iron-Based Superconductors

The phase diagram of the high-T_c cuprates is dominated by the Mott insulating phase of the parent compounds. As we approach it from large doping, a standard Fermi-liquid gradually turns into a bad non-Fermi liquid metal, a process which culminates in the pseudogap regime, in which the antinodal region in momentum space acquire a gap before reaching a fully gapped Mott state. The strong correlation effects are therefore believed to be the unifying element to understand both the anomalous normal state and the superconducting phase.

On the other hand, in iron-based superconductors the parent compounds are not Mott insulators, and the role of electron correlations is still unclear and debated.

Here we show that experiments for electron- and hole-doped $BaFe_2As_2$ support indeed a scenario very similar to that of the cuprates. The doping evolution of the effective mass is dominated by the influence of a Mott insulator that would be realized for half-filled conduction bands, while the metallic stoichiometric compound does not play a special role. Weakly and strongly correlated conduction electrons coexist in much of the phase diagram, an effect which increases with hole doping.
We identify the reason for this behavior in a strong Hund's coupling, which decouples the different orbitals. Each orbital then behaves as an independent doped Mott insulator, where the correlation degree only depends on how doped is each orbital from half-filling.
Our scenario reconciles contrasting evidences on the electronic correlation strength and establishes a deep connection with the cuprates, which can be extended to the superconducting state.

Gäste sind herzlich willkommen!
Der Vortrag findet im Seminarraum S-288/Physik-Süd, Universität Augsburg statt.
Gastgeber: Dr. Joachim Deisenhofer