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ARNOLD SOMMERFELD
CENTER FOR THEORETICAL PHYSICS



Arnold Sommerfeld Lecture Series

Professor Antoine Georges

Collège de France
and
Ecole Polytechnique, France

Solid State Theory Seminar:

Death of a Quasiparticle

According to the Landau description of Fermi liquids, low-energy excitations in metals are constructed out of quasiparticles – long-lived excitations which have the same quantum numbers as those of an electron in vacuum. In metals with strong correlations however, quasiparticles become fragile: they are destroyed above a characteristic energy or temperature scale, the quasiparticle coherence scale. This energy scale can be remarkably low, even in materials which are not close to a Mott metal-insulator transition, for example as a result of the Hund's rule coupling. I will provide evidence that this is relevant for many materials, especially oxides of the 4d transition metals. In other materials, such as cuprates, quasiparticles are destroyed selectively in specific regions of momentum-space. The understanding of charge and thermal transport in such "bad metals" is a key issue, with both fundamental and practical implications.

Friday, 28th January 2011, 10:15 h, Room A 449, Theresienstr. 37, LMU