

Aspects of strongly correlated electrons

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Some recent progress in the theory of strongly correlated electrons will be discussed. One specific example concerns our understanding of 5f electrons in intermetallic systems containing, e.g., U ions. Here a dual model based on strong intra-atomic Hund's rule correlations gives excellent results for the low energy excitations, i.e., the Fermi surface and the large anisotropic effective mass of the system.

Another example are strongly correlated electrons in frustrated lattices like the pyrochlore, checkerboard or kagome lattice. At certain lattice fillings excitations with confined fractional charges may exist. Although one can at present not point out any specific material where these excitations could be observed, the model calculations provide interesting perspectives.