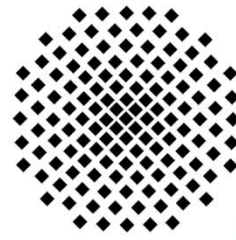


Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart
Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme

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Dienstag, 2. Juni 2015

17:15 Uhr

Hörsaal V 57.01

Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

Gastgeber: Prof. Dr. Harald Gießen, Universität Stuttgart, Telefon: 0711 - 685-65110

Correlations and Topology in multi-orbital models

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Abstract

Electronic correlations have long been known to fundamentally affect a material's property. Topological aspects of electronic states in solids have attracted renewed interest in recent year. I will discuss situations where these two fields overlap, in particular, where interactions between electrons generate topologically nontrivial states. The main focus of my work are here multi-orbital systems, where the interplay of spin orbital and charge degree of freedom leads to a particularly rich phase diagram. Interaction between itinerant carriers and localized spins can stabilize states that are in many respects similar to a Landau level, and longer-range Coulomb interaction might even induce states that are like lattice-analogs of fractional Quantum-Hall states. I will present numerical evidence of such behavior and of states that go beyond the physics of Landau levels: They show a combination of conventional (charge) and topological order and are related to the geometric frustration of the triangular lattice.