

Physikalisches Kolloquium

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»Dirac Materials«

Einführung: J. Schmalian

Discoveries of superfluid phases in ^3He , high T_c superconductors, graphene and topological insulators have brought into focus materials where quasiparticles are described by same Dirac and Weyl equation that governs behavior of relativistic particles. This class of materials, called Dirac materials, exhibits unusual universal features: Klein tunneling, chirality and impurity resonances. I will explore these similarities and discuss the unique role of symmetries that protect the Dirac spectrum. As an example of universal behavior of Dirac-Weyl materials I will consider impurity resonances and magnetically doped topological insulators. I will also discuss Dirac materials quantum imaging and how the ripples in the Dirac sea produced by defects can induce fascinating features in local magnetism and Kondo effect. At the end I will outline future opportunities to design Dirac materials that host bosonic Dirac excitations, something that would not be possible in particle physics.

Freitag, 05.05.2017, 15:45 Uhr,

**KIT, Campus Süd,
Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22).
Anschließend Nachsitzung im Gastdozentenhaus „Heinrich Hertz“**