Stuttgarter Physikalisches Kolloquium

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

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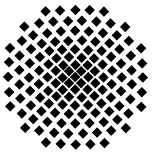

Dienstag, 19. April 2016 | **17.15 Uhr** | **Hörsaal 2 D5**

Stuttgarter Max-Planck-Institute, Heisenbergstraße 1, 70569 Stuttgart-Büsnau

Topological States of Matter

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Abstract

Topological Phases of Matter have been one of the most interesting discoveries in condensed matter. These systems, which are bulk insulators but edge metals have remarkable properties such as holographic imprinting of edge states, protection from backscattering, and nontrivial responses upon application of external stimuli – such as electric and magnetic fields. I will review the progress in the field of topological insulators, and show that the future belongs to a new set of systems protected by a special symmetry of the lattice, a so-called “nonsymmorphic symmetry”. In parallel, I will review very recent progress on topological semimetals - bulk metals that are protected from gapping by certain topological properties. These systems have attracted much recent interest, and have realized several species of fermions (Weyl, gapless Dirac) whose existence has been elusive more than 80 years after their prediction. I will show how other bulk semimetals, some involving line nodes, some involving large degeneracy fermions – unknown to high-energy physics – protected by symmetries can exist in realistic materials