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Stuttgarter Physikalisches Kolloquium

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

Ansprechpartner: Dirk Manske
E-Mail: D.Manske@fkf.mpg.de
Telefon: 0711 689-1552

Hybrid

Login data will be announced by e-mail and on the colloquium webpage.

Dienstag, 17. Dezember 2024 | **16.15 Uhr** | **Lecture Hall 2D5**

Max-Planck-Institut für Festkörperforschung, Heisenbergstraße 1, 70569 Stuttgart-Büsnau

Optical response of topological semimetals: role of lattice symmetry, magnetism and electronic correlations

Christine Kuntscher
Institut für Physik, Universität Augsburg

Abstract

Topological semimetals with linearly dispersing energy bands, which cross at points or lines in the bulk Brillouin zone close to the Fermi energy, are in the focus of condensed matter research. The linearly dispersing fermionic excitations can be described by the massless Dirac and Weyl equations and are very different from parabolic electronic bands found in many metals. In this talk, I will discuss the low-energy excitations of Dirac fermions from the perspective of linear optical spectroscopy. The important role of lattice symmetry will be emphasized by looking at two examples – the square-net lattice and the kagome lattice – which are realized in several three-dimensional crystals. The characteristic signatures of the low-energy excitations in square-net and kagome materials will be presented based on two prominent examples: the nodal-line semimetal ZrSiS and the kagome magnet FeSn. How magnetism and electronic correlations influence their electronic properties will be briefly discussed.