Stuttgarter Physikalisches Kolloquium

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

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

Dienstag, 1. Juni 2021	16:15 Uhr	Online-Vortrag

Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

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Magnetic Materials and Topology

Claudia Felser
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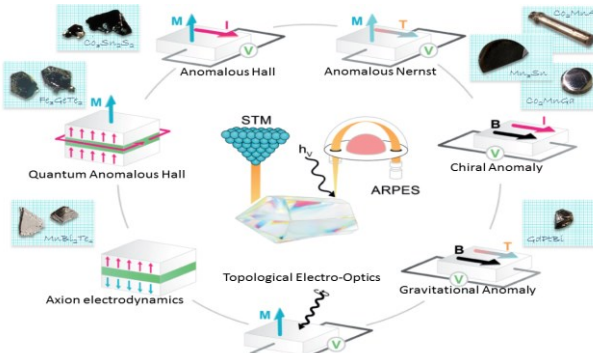

Abstract

Topology, a mathematical concept, recently became a hot and truly transdisciplinary topic in condensed matter physics, solid state chemistry and materials science. All 200 000 inorganic materials were recently classified into trivial and topological materials: topological insulators, Dirac, Weyl and nodal-line semimetals, and topological metals [1]. Around 20% of all materials host topological bands. Currently, we have focussed also on magnetic materials, a fertile field for new since all crossings in the band structure of ferromagnets are Weyl nodes or nodal lines [2], as for example Co2MnGa and Co3Sn2S2. Beyond a single particle picture and identified antiferromagnetic topological materials [3]. An important feature for the design of new magnetic materials is the Berry curvature, in real and reciprocal space. Non collinear behaviour is observed in several of the materials withWeyl points [4] and/or anti-skyrmkions [5].

1. Bradlyn et al., Nature 547 298, (2017), Vergniory, et al., Nature 566 480 (2019).
2. Belopolski, et al., Science 365, 1278 (2019), Liu, et al. Nature Physics 14, 1125 (2018), Guin, et al. Advanced Materials 31 (2019) 1806622, Liu, et al., Science 365, 1282 (2019), Morali, et al., Science 365, 1286 (2019)
3. Xu et al. Nature 586 702 (2020)
4. Manna, Sun, Müchler, Kübler, Felser, Nature Reviews Materials 3, 244 (2018)
5. Nayak, et al., Nature 548, 561 (2017), Saha et al, Nature Communications 10, 5305 (2019) Jena et al., Sci. Adv. 2020; 6 : eabc0723