

Magnetic materials and topology

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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].

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 (2020) 702.

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Session Classification : Inspiration for the use of high-B fields

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