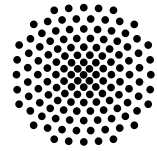


Stuttgarter Physikalisches Kolloquium

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

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Hybrid login data will be announced by email and on the colloquium webpage.

Dienstag, 10. Mai 2022

16.15 Uhr

Hörsaal 2D5

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

Nonreciprocal transport in Dirac materials

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Abstract

In this colloquium, I will talk about two very different material systems, the topological semimetal ZrTe_5 [1] and gated topological insulator nanowires [2]. In both systems, we found gigantic magnetochiral anisotropy (MCA), which is a nonreciprocal transport effect induced by magnetic field in the absence of inversion symmetry. The low-energy physics of these systems is described by Dirac equations and the broken inversion symmetry leads to peculiar spin textures, which is the fundamental origin of the MCA. The MCA in ZrTe_5 is orders of magnitude larger than what is expected from theory and is the largest ever observed as a bulk materials property. On the other hand, the MCA in gated topological insulator nanowires is a mesoscopic effect which amplifies the MCA coefficient to be even larger than that in ZrTe_5 .

References:

[1] Y. Wang *et al.*, arXiv:2011.03329.

[2] H. F. Legg *et al.*, arXiv:2109.05188.