PHYSIKALISCHES KOLLOQUIUM

des Fachbereichs Physik
der Johann Wolfgang Goethe-Universität Frankfurt

Mittwoch, den 12.07.2023, 16 Uhr c.t.
Großer Hörsaal, Raum _0.111,
Max-von-Laue-Str. 1

Prof. Dr. Mathias Kläui

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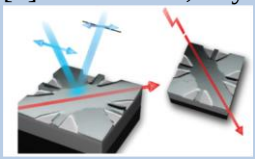
IEEE Magnetics Society Distinguished Lecturer 2020/2021

Antiferromagnetic Spintronics: Spintronics without magnetic fields and Moving Electrons

While known for a long time, antiferromagnetically ordered systems have previously been considered, as “interesting but useless”. However, since antiferromagnets potentially promises faster operation, enhanced stability and higher integration densities, they could potentially become a game changer for new spintronic devices. Here I will show how antiferromagnets can be used as active spintronics devices by demonstrating the key operations of “reading” [1], “writing” [2], and “transporting information” [3] in antiferromagnets. Beyond typical bulk and thin film systems, recently also antiferromagnetic van der Waals materials have been discovered [4], which bode particularly well for manipulation by efficient interface effects.

[1] S. Bodnar et al., Nature Commun. 9, 348 (2018); L. Baldrati et al., Phys. Rev. Lett. 125, 077201 (2020)
[2] L. Baldrati et al., Phys. Rev. Lett. 123, 177201 (2019); H. Meer et al., Nano Lett. 21, 114 (2020); S. P. Bommanaboyena et al., Nature Commun. 12, 6539 (2021);
[3] R. Lebrun et al., Nature 561, 222 (2018). R. Lebrun et al., Nature Commun. 11, 6332 (2020). S. Das et al., Nature Commun. 13, 6140 (2022).
[4] R. Wu et al., Phys. Rev. Appl. 17, 064038 (2022).



Die Dozentinnen und Dozenten der Physik

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