



IEEE Magnetics Society Distinguished Lecturer

Antiferromagnetic Insulatronics:

Spintronics without magnetic fields



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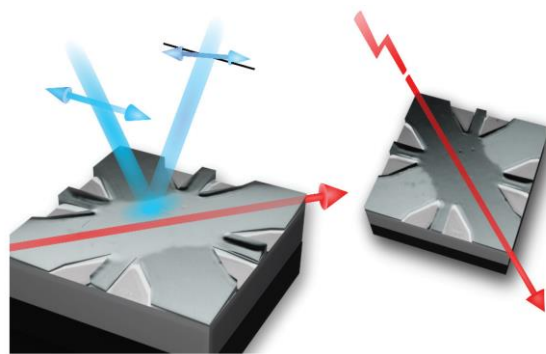
Abstract

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.

[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)

[3] R. Lebrun et al., Nature **561**, 222 (2018). R. Lebrun et al., Nature Commun. **11**, 6332 (2020).



About the speaker

Mathias Kläui is professor of physics at Johannes Gutenberg-University Mainz and adjunct professor at the Norwegian University of Science and Technology. He received his PhD at the University of Cambridge, after which he joined the IBM Research Labs in Zürich. He was a junior group leader at the University of Konstanz and then became associate professor in a joint appointment between the EPFL and the PSI in Switzerland before moving to Mainz. His research focuses on nanomagnetism and spin dynamics on the nanoscale in new materials. His research covers from blue sky fundamental science to applied projects with major industrial partners. He has published more than 300 articles and given more than 200 invited talks. He is a Senior member of the IEEE and, a Fellow of the IOP and APS and has been awarded a number of prizes and scholarships. He is one of the 2020/2021 IEEE Magnetics Society Distinguished Lecturers.