Poster 16

Flat bands in a kagome ferromagnet

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The kagome (woven bamboo mat) lattice, a triangular network with one quarter of its nodes removed, is a particularly simple venue for seeing classical and quantum effects of frustration. Theoretical approaches have yielded many interesting conjectures (including for example the possibilities of quantum spin liquids and a fractional quantum Hall effect at zero applied field for ferromagnets), but experiments on real materials containing kagome layers have not validated even relatively straightforward predictions, such as flat bands, especially for metals. This follows because of the three-dimensionality and large unit cells of the materials. We describe recent progress exploiting both density functional theory [1] and various spectroscopic tools [2, 3] towards identifying flat bands in a kagome system, Fe_3Sn_2.

[1] M. Yao *et al.*, *Switchable Weyl nodes in topological Kagome ferromagnet Fe_3Sn_2*, arXiv:1810.01514 (2018).
[2] S. A. Ekahana *et al.*, *Anomalous quasiparticles in the zone center electron pocket of the kagomé ferromagnet Fe_3Sn_2*, arXiv2206.13750 (2022), accepted for publication in Nature.
[3] W. Zhang *et al.*, *Spin waves in a ferromagnetic topological metal*, arXiv:2302.01457 (2023).