

Topology in Three-Dimensional Kagome Magnets

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Abstract. Certain members of the iron-stannide family, which includes Fe₃Sn, Fe₃Sn₂, and FeSn, have been shown to exhibit a rich variety of topological features — flat bands [1], Dirac crossings [2], and three-dimensional Weyl nodes [3, 4] — deriving from their layered kagome structures, which differ in the stacking of kagome layers relative to the interlayer stanene sheets, as well as the geometric structures of the kagome layers themselves. This poster presents preliminary findings from our study of Fe₃Sn₂, a topological ferromagnet, known to exhibit large anomalous Hall and Nernst effects [5], flat bands [6], and nodal lines [3]. We perform a theoretical investigation of the connection between magnetic and topological properties, along with the possible effects of strong correlations on the electronic structure, by way of, in particular, density functional theory (DFT) calculations.

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