

Abstract Submitted
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Topology and symmetries in gyroscopic lattices LISA M. NASH, NOAH P. MITCHELL, James Franck Institute, The University of Chicago, ARI M. TURNER, Technion Israel Institute of Technology, WILLIAM T.M. IRVINE, James Franck Institute, Enrico Fermi Institute, The University of Chicago — Mechanical metamaterials – including static frames, coupled pendula, and gyroscopic lattices – can support topologically protected vibrational behavior. In particular, fast-spinning gyroscopes pinned on a honeycomb lattice break time-reversal symmetry and exhibit topologically protected, one-way edge modes. As in electronic systems, symmetries play an important role in determining the topological properties of the material. Here we present the roles of inversion symmetry, local coordination number, and time reversal symmetry on the band topology of gyroscopic metamaterials with several lattice geometries.

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