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Amorphous Kramer-Weyl semimetals

While nearly half of all crystals exhibit topological properties, little is known about topology in amorphous materials. In this study, we developed a model of amorphous chiral Kramer-Weyl semimetals, where widely used topological markers such as the Bott index or the local Chern marker are trivially zero due to time-reversal symmetry. We thus proposed an alternative way to characterize the survival of Weyl fermions in strongly disordered systems. Our results indicate that the doubling Nielsen-Ninomyia theorem, which states that Weyl fermions must come in pairs of opposite chiralities on a periodic lattice, also holds in the absence of long-range lattice order.

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