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Topology and energetics of skyrmions in chiral liquid crystals¹

AYHAN DUZGUN, JONATHAN SELINGER, Kent State Univ - Kent, AVADH SAXENA, Los Alamos National Laboratory — Skyrmions are localized topological defects in the orientation of an order parameter field, without a singularity in the magnitude of the field. For many years, such defects have been studied in the context of chiral liquid crystals—for example, as bubbles in a confined cholesteric phase or as double-twist tubes in a blue phase. More recently, skyrmions have been investigated extensively in the context of chiral magnets. In this talk, we compare skyrmions in chiral liquid crystals with the analogous magnetic defects. Through simulations based on the nematic order tensor, we model both isolated skyrmions and periodic defect lattices. We determine how the topology and energetics of these defects are affected by easy-axis or easy-plane anisotropy, and by local biaxiality of the liquid-crystal order.

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