Topological and Correlated Effects in Chiral Crystals

Chiral crystals are distinguished by their unique handedness due to the absence of inversion, mirror, and other roto-inversion symmetries. Initially, we demonstrate that chiral crystals inherently support topological chirality, manifesting as quasiparticles with quantized Chern numbers in momentum space [1,2]. Recent research has highlighted that the convergence of topology and electronic correlations can give rise to many new quantum states of matter [3,4,5]. Consequently, in the second part of our talk, we delve into the interaction between topological chiral crystals and strong electron correlations. Specifically, we elucidate the unique quantum phenomena induced by charge density waves in chiral crystals [6].

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