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Quantum Anomalous Hall effect in a Topological Insulator coupled to a Skyrmion Lattice.[1] TONMOY BHOWMICK, YAFIS BARLAS, GEN YIN, ROGER LAKE, Univ of California - Riverside — A Skyrmion is a topologically protected spin texture characterized by a topological charge that has been experimentally observed in both bulk B20 compounds and thin films. In a quantum anomalous Hall phase, a material develops a topologically nontrivial electronic structure giving rise to quantized hall conductivity without any external magnetic field. We predict that a conventional bulk topological insulating material (e.g. $Bi_2 Se_3$, $Bi_2 Te_{3,} Sb_2 Te_3$) in proximity with a Skyrmion crystal, with a weak exchange coupling, will be driven into an anomalous Hall insulating phase characterized by a nonzero integer chern number in the gap. We have calculated band structure, identified the gaps, and calculated the chern number at those gaps. The calculations show that the non trivial topological properties of the Skyrmion spin texture can be imprinted on the Dirac electrons of the topological insulator.

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