

Intrinsically Gapless Topological Matter

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Topological phases of matter are celebrated for their exotic properties, such as conducting edge modes or fractionalized quasiparticles. However, such topological phases typically require a nonzero energy gap as a defining property. In this talk, we will explore how even ground states with vanishing energy gaps can host robust topological phenomena. In fact, there exist examples of topologically-protected edge modes which can **only** appear on the boundary of gapless phases of matter. Such 'intrinsically gapless topological phases' motivate a generalization of the concept of anomalous symmetries and lead to unusual conduction properties, which we elucidate by introducing an exactly-solvable two-dimensional lattice model.