

Title: Reduction of the classification of topological insulators and superconductors by quartic interactions

Abstract:

I will discuss the stability and breakdown of the topological classification of gapped ground states of non-interacting fermions, the tenfold way, in the presence of quartic fermion-fermion interactions. In our approach [1], the effects of interactions on the boundary gapless modes are encoded in terms of boundary dynamical masses. Breakdown of the non-interacting topological classification occurs when the quantum nonlinear sigma models for the boundary dynamical masses favor quantum disordered phases. The non-interacting topological classification Z in odd spatial dimensions is unstable and reduces to Z_N that can be identified explicitly for any dimension and any defining symmetries.

[1] T. Morimoto, A. Furusaki, and C. Mudry, Phys. Rev. B 91, 235111 (2015).