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Topological superconductivity and Majorana edge modes in trionic phases

Wednesday, 18 May 2016 12:30 (20 minutes)

In this talk, I propose a new model that supports two-dimensional topological phases. The tight-binding model defined on the Lieb lattice with three different species of fermions supports a single Dirac-like point in the momentum space. The dispersion relation around this point is fully relativistic and described by a Duffin-Kemmer-Petiau Hamiltonian. I show the presence of topologically protected edge states by employing the entanglement spectrum. Importantly, these edge modes become Majorana modes by introducing suitable Cooper pairings in the lattice. This model represents the first example of topological superconductor in two-dimensional trionic phases.

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