

Abstract Submitted
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Topological Superconductivity and Superfluidity TAYLOR HUGHES, XIAO-LIANG QI, S. RAGHU, SHOU-CHENG ZHANG, Stanford University — We construct time reversal invariant topological superconductors and superfluids in two and three dimensions. These states have a full pairing gap in the bulk, gapless counter-propagating Majorana states at the boundary, and a pair of Majorana zero modes associated with each vortex. The superfluid ^3He B-phase provides a physical realization of the topological superfluidity, with experimentally measurable surface states protected by time-reversal symmetry. We show that the time reversal symmetry naturally emerges as a supersymmetry, which changes the parity of the fermion number associated with each time-reversal invariant vortex and connects each vortex with its superpartner.

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