

Abstract Submitted
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Ising Anyons in frustration-free Majorana-Dimer models: Construction and Spectrum JUN HO SON, Stanford Univ, BRAYDEN WARE, University of California - Santa Barbara, MENG CHENG, Yale University, RYAN MISHMASH, JASON ALICEA, California Institute of Technology, BELA BAUER, Microsoft Station Q — Dimer models have long been a fruitful playground for understanding topological physics. This talk introduces a new classtermed Majorana-dimer models wherein bosonic dimers are decorated with pairs of Majorana modes. We show that it is possible to construct a gapped, frustration-free, and analytically tractable Majorana-dimer Hamiltonians on the triangular and Fisher lattices. By analyzing the low-energy spectrum, we establish the following properties: (1) edges are fully gapped, (2) the bulk supports deconfined Ising anyons, and (3) on a torus the system admits three-fold ground-state degeneracy. From these, we suggest that these Hamiltonians possess non-Abelian Ising topological order that generalizes the Z_2 topological order familiar from pure dimer models.

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