Abstract Submitted
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Three-dimensional generalized Kitaev models[1] ZHOUSHEN HUANG, DANIEL AROVAS, University of California, San Diego — We generalize Kitaev's honeycomb lattice spin model to a gamma matrix model on three-dimensional cubic octahedron and pyrochlore lattices. We find the ground state Z_2 flux configuration, reducing the problem to free Majorana fermion hopping. For the cubic octahedron lattice, which has reflection planes, the ground states must obey Lieb's theorem, i.e. the Z_2 fluxes are reflection symmetric. By adding flux-flux interaction terms, a variety of interesting phases can be stabilized, including metallic, semimetallic, and both trivial and topological insulating phases.

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