Topological Mott Insulators[1] SRINIVAS RAGHU, XIAO-LIANG QI, Stanford University, CARSTEN HONERKAMP, Universität Würzburg, SHOU-CHENG ZHANG, Stanford University — We consider extended Hubbard models with repulsive interactions on a Honeycomb lattice, and the transitions from the semi-metal to Mott insulating phases at half-filling. Due to the frustrated nature of the second-neighbor interactions, topological Mott phases displaying the quantum Hall and the quantum spin Hall effects are found for spinless and spinful fermion models, respectively. The mean-field phase diagram is presented fluctuations are treated within the random phase approximation (RPA). Renormalization group analysis shows that these states can be favored over the topologically trivial Mott insulating states.

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