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Topological Phases of Fermions in Kagome Optical Lattices[1] VITO SCAROLA, MENGSU CHEN, HOI HUI, Virginia Tech — Frustration can favor topological states of matter over conventionally ordered states. We use numerical diagonalization and mean field theory to study models of fermionic atoms and molecules placed in kagome optical lattices. We show that just the long range part of dipolar interactions between fermions can drive the creation of a topological Mott insulator. We also study applications of applied synthetic fields using optical flux lattices and laser assisted tunneling. We find that effective magnetic fields lead to topological phases, including the chiral spin liquid, even for atoms interacting with only the contact interaction. Experimental challenges for realizing these topological states with atoms in optical lattices are discussed.

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