Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Emergent Topological Phases with Multiple Bands and Artificial Gauge Fields ALEXANDRU PETRESCU, Yale University Physics Department, New Haven, CT, 06520 USA, KARYN LE HUR, Yale University Physics Department, New Haven, CT, 06520 USA and Center for Theoretical Physics (CPHT), Ecole Polytechnique, Palaiseau 91128, France — Particles on a two-dimensional Kagome lattice have attracted growing attention recently in relation to topological insulators and topological phases. Such Kagome structures can be engineered in optical lattices and can also be loaded with bosons. Similar tight-binding models might also be realized in photonic QED circuits. In this work, we investigate in detail the 3-band model emerging from such a tight-binding model on the two-dimensional Kagome lattice in the presence of artificial gauge fields and identify novel phases of matter such as bulk metals with helical edge states. We investigate the stability of edge modes inside a topological metallic phase and the role of lattice anisotropies and disorder, as well as relation to current experiments.

Alexandru Petrescu
Yale University Physics Department, New Haven, CT, 06520 USA

Date submitted: 10 Nov 2011 Electronic form version 1.4