

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Theory of a Competitive Spin Liquid State for Weak Mott Insulators on the Triangular Lattice RYAN V. MISHMASH, JAMES R. GARRISON, University of California, Santa Barbara, SAMUEL BIERI, Massachusetts Institute of Technology, CENKE XU, University of California, Santa Barbara — We propose a novel quantum spin liquid state that can explain many of the intriguing experimental properties of the low-temperature phase of the organic spin liquid candidate materials κ -(BEDT-TTF)₂Cu₂(CN)₃ and EtMe₃Sb[Pd(dmit)₂]₂. This state of paired fermionic spinons preserves all symmetries of the system, and it has a gapless excitation spectrum with quadratic bands that touch at momentum $\vec{k} = 0$. This quadratic band touching is protected by symmetries. Using variational Monte Carlo techniques, we show that this state has highly competitive energy in the triangular lattice Heisenberg model supplemented with a realistically large ring-exchange term.

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Date submitted: 13 Nov 2013

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