

MAR06-2005-002612

Abstract for an Invited Paper
for the MAR06 Meeting of
the American Physical Society

Spin Liquid States in the Hubbard Model: Implications for Organics¹

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We formulate a U(1) gauge theory of the Hubbard model in the slave-rotor representation. From this formalism it is argued that spin liquid phases may exist near the Mott transition in the Hubbard model on triangular and honeycomb lattices at half filling. The organic compound κ -(BEDT-TTF)₂Cu₂(CN)₃ is a good candidate for the spin liquid state on a triangular lattice. We predict a highly unusual temperature dependence for the thermal conductivity of this material.

¹Sung-Sik Lee and P.A. Lee, Phys. Rev. Lett. **95**, 036403.