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Criticality in 2-D frustrated quantum triangular antiferromagnets

JASON ALICEA, MICHAEL HERMELE, Dept. of Physics, UCSB, OLEXEI I. MOTRUNICH, MATTHEW P. A. FISHER, Kavli Institute for Theoretical Physics, UCSB — We revisit 2-D frustrated quantum magnetism from a new perspective, with the aim of exploring new critical points and exotic critical phases. We study easy-plane s = 1 and s = 1/2 triangular antiferromagnets using a dual vortex approach, fermionizing the vortices with a Chern-Simons field. This enables us to formulate a low-energy QED3 critical theory with emergent SU(2) and SU(4) flavor symmetry in the s = 1 and s = 1/2 cases, respectively. We conjecture that the SU(2) theory describes a multicritical point separating the quantum paramagnet and two magnetically-ordered states, while the SU(4) theory describes a new stable gapless spin-liquid phase.

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