Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Classification of Z_2 spin liquids in a hyperkagome lattice by projective symmetry groups BIAO HUANG, Ohio State Univ - Columbus, YONG BAEK KIM, University of Toronto; Korea Institute for Advanced Study, YUAN-MING LU, Ohio State Univ - Columbus — Being a rare candidate material supporting 3D spin liquid states, $Na_4Ir_3O_8$ has attracted much theoretical and experimental interest in the past decade. Propelled by such developments, we give a complete classification of Z_2 spin liquid states in the hyperkagome lattice formed by Ir^{4+} ions in the projective symmetry group approach. A list of mean field states with different fractional quasi-particle excitations are correspondingly given, and their excitation gaps are analyzed. The effects of spin-orbit coupling due to the $5d$ electrons in Ir are also discussed. This work paves the way for further variational Monte-Carlo study of the spin liquid physics in hyperkagome lattices.

Biao Huang
Ohio State Univ - Columbus

Date submitted: 03 Nov 2015 Electronic form version 1.4