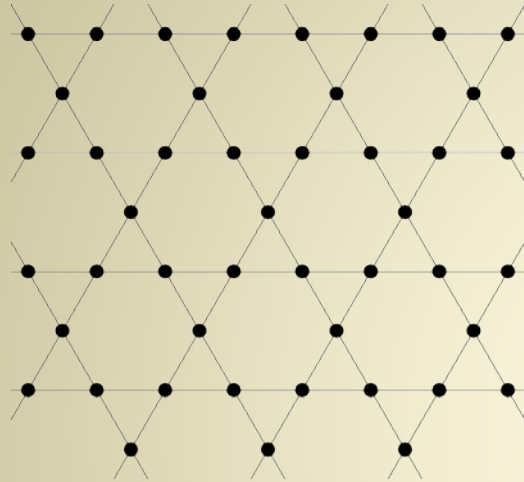


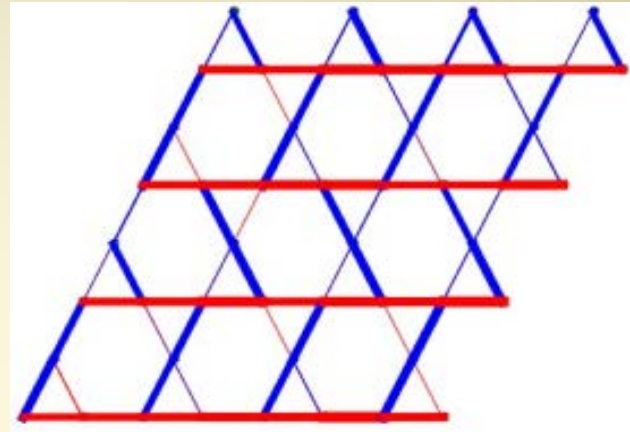


# SEED: Liquid crystal order in the kagome lattice (DMR 0819860)

SEED : Garnet Chan and David Huse  
Princeton Center for Complex Materials (PCCM)



kagome lattice



striped spin-liquid

The kagome lattice is an outstanding example of a frustrated magnet, a system in which the magnetic moments cannot satisfactorily align to minimize the energy. Its ground-state configuration has been a long-standing puzzle. Recent debate has focused on the relative stability of a valence bond-crystal, and an isotropic spin-liquid (where quantum fluctuations cause all ordering to disappear). Using numerical techniques, we have shown [1] that there is an intermediate competing order, where moments align along parallel lines, but are not ordered along the lines themselves, much like a liquid crystal. This type of nematic order has so far been neglected in the characterization of frustrated magnets, but may in fact be very common: the same broken symmetry, suggestive of the nematic phase, is seen in kagome-like materials volborthite and Zn-doped paratacamite.

1) B. Clark, J. Kinder, E. Neuscamman, **G. Chan**, M. Lawler, Phys. Rev. Lett. *submitted*.