

Spin nematics and other multipolar states of frustrated magnets

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ABSTRACT: Strong geometrical frustration may preclude conventional magnetic ordering. A common outcome is a strongly-correlated but disordered spin-liquid state at low temperatures. Another fascinating possibility is a partial breaking of the spin-rotational symmetry described by spin-tensor order parameters. Such states are similar to well-known liquid crystals, in which molecules align to break the rotational symmetry without choosing space periodicity. In this talk I give an introduction into the multipolar states produced by strong spin correlations and discuss in more detail two recent examples: (i) the octupolar state of the classical kagome antiferromagnet and (ii) the spin-nematic condensate of bound magnon pairs in quantum magnets with competing ferro- and antiferromagnetic bonds.

ALL ARE WELCOME!