

Abstract Submitted
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Spin-nematic order in the frustrated pyrochlore-lattice quantum rotor model¹ KAROL GREGOR, DAVID A. HUSE, S.L. SONDHI, Princeton University — As an example of ordering due to quantum fluctuations, we examine the nearest-neighbor antiferromagnetic quantum $O(N)$ rotor model on the pyrochlore lattice. Classically, this system remains disordered even at zero temperature; we find that adding quantum fluctuations induces an ordered phase that survives to positive temperature, and we determine how its phase diagram scales with the coupling constant and the number of spin components. We demonstrate, using quantum Monte Carlo simulations, that this phase has long-range spin-nematic order, and that the phase transition into it appears to be first order.

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