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Heisenberg antiferromagnet on the pyrochlore lattice

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The Heisenberg antiferromagnet on the network of corner-sharing tetrahedra (the "pyrochlore lattice") is arguably the world's most frustrated system: the classical version of this magnet has a ground state with an extensive entropy and shows no sign of magnetic order in numerical simulations [1]. A real-life incarnation of this model is found in $ZnCr_2O_4$, which exhibits several peculiar effects traceable to the strong frustration: a spin-Peierls-like phase transition [2], a strongly correlated paramagnetic state with zero modes [3], and a magnetization plateau in high magnetic fields [4]. I will review recent theoretical and experimental developments in this area of research.

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