

Frustrated magnetism and quantum computing

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Frustration is a universal concept which describes a situation where several competing interactions are present, which takes place not only in physics but also biology. The compromise of such interactions may result in a completely exotic ground state. In frustrated magnets such competition can yield a loss of long-range magnetic order due to strong quantum fluctuations - a so-called quantum spin liquid state. It is fascinating that frustration can come from both the structure of the lattice, such as the ones containing triangular motifs, as well as anisotropic interactions, e.g. Dzyaloshinskii-Moriya, Kitaev - both driven by spin-orbit coupling. The fractional excitations of spin liquids drew interest as a path towards topological quantum computation, which is stable towards small errors, plaguing standard quantum computing platforms. In this talk we review recent examples of spin liquid candidates and why they are hard to come by.

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