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New Routes to Quantum Spin Liquid Physics

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The quantum spin liquid (QSL) is a quantum entangled and dynamical ground state of a magnetic material with strange fractional excitations. This enticing phenomenon was predicted decades ago to occur in materials with competing (frustrated) interactions. However, the road to discovering real materials of this nature is a long one and it is only recently that we have access to several good QSL candidates. Most often the search for QSLs has concentrated on simple frustrated, spin-1/2 models. I will show that some of the most recent discoveries in this vein have come in unusual places, in systems with additional degrees of freedom or larger magnetic moments even on normally unfrustrated lattices. In addition to a general introduction, I will present some of my recent contributions to these discoveries, specifically in measuring magnetic properties at the microscopic (local) level with the nuclear magnetic resonance (NMR) and muon spin rotation (muSR) techniques.

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