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Abstract for an Invited Paper  
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### **Exotic Phases and Fractionalization in Frustrated Quantum Magnets<sup>1</sup>**

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Recent work shows that excitations with fractional quantum numbers can emerge in two and three dimensions in zero magnetic field in quantum systems with competing interactions. This can occur throughout an entire “exotic” phase or in the vicinity of isolated quantum critical points between conventional phases. Such phases or critical points require thinking beyond the usual paradigms of mean field theory and broken symmetry. The talk will outline efforts to identify and understand such phenomena in simple physical models appropriate to semi-realistic quantum magnets, cold trapped atoms, and strongly correlated superconductors.

<sup>1</sup>Parts of this talk may be based on collaborations with L. Bartosch, D. Bergman, A. A. Burkov, G. Fiete, M.P.A. Fisher, D.-N. Sheng, O.A. Starykh, S. Sachdev, T. Senthil, K. Sengupta, A. Vishwanath.