

The Frustrated World of Quantum Spin Liquids

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Abstract

In frustrated magnets, the magnetic interactions compete and prevent simple ordered magnetic ground states. As a consequence, exotic magnetic phases like a spin liquid can occur; in spin liquids, the magnetic moments interact strongly but never freeze even at lowest temperatures. In quantum spin liquids, highly degenerate states in combination with strong quantum fluctuations lead to exotic excitations. Such phases are intensively investigated because they are candidates for technologies that could revolutionize computing - they could become important in quantum computers. Besides, the search for quantum spin liquids has driven innovation both in theory and in experiment already for several decades. We will show that determining magnetic interactions theoretically helps identify materials with exotic ground and excited states.

Bio

Harald O. Jeschke received his doctorate from the Freie Universitaet Berlin in 2000. After postdoctoral work at Rutgers, he became junior research group leader at Goethe-Universitaet Frankfurt, Germany. Since 2017, he has been on the faculty of the Research Institute for Interdisciplinary Science at Okayama University, Japan. Harald O. Jeschke's research employs first principles and many body approaches to problems of magnetism and superconductivity; he also works on organic charge transfer salts and strongly correlated electron materials.