

CSU PHYSICS COLLOQUIUM

“Quantum Magnetism”

Kate Ross

Colorado State University

Monday, Sept. 28th at 4:00pm

Virtual via Zoom (see announcement for link)

Abstract

When interactions are strong between spins on a lattice, complex many-body collective effects can occur. With low spin values like $S=1/2$, quantum mechanical effects can play a both a *qualitative* and quantitative role in determining these collective behaviors. Entanglement and strong quantum fluctuations can completely change the nature of the magnetic material, making such states interesting platforms for studying quantum many-body effects, both in and out of equilibrium. Quantum magnetic phases are therefore sought-after in real materials. I will give a broad view of the subject of quantum magnetism, and highlight some of our recent work in this area, including phase competition in spin-orbit-coupled materials, and an unusual “quantum dimer magnet” that we have discovered.