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**Quantum dynamical behavior near a phase transition in antiferromagnetic spinor Bose-Einstein condensates<sup>1</sup>**  
CHANDRA RAMAN, Georgia Inst of Tech

Many-body quantum dynamics has come under intense focus in recent years, with a variety of experimental systems—atoms, ions and solid state qubits—emerging as key platforms for inquiry. One key set of questions concerns the ability of any such delicately tailored quantum system to relax to equilibrium when it is isolated from the environment. In this talk I will present our group's efforts to address this question using magnetic quantum fluids comprised of Bose-Einstein condensed atoms (BECs). A key experimental discovery of our group in recent years is the existence of a sharp phase boundary in antiferromagnetic sodium BECs through quantum quench dynamics. In this talk I will show data demonstrating the rich interplay between many actors—spin-spin interactions, the influence of external magnetic fields, and the spatial quantum dynamics of many interacting modes that all compete to determine the non-equilibrium behavior.

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