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Quantum Phase Transitions: A Network Approach[1] DAVID L. VARGAS, DAVID M. LARUE, LINCOLN D. CARR, Colorado School of Mines — Understanding the network structure of complex systems has opened up new avenues of research in sociology, biology, technology, and physics. In this talk we present evidence that complex network measures are able to identify the phases in two well known models. We distinguish the ferromagnetic and paramagnetic phases of the transverse Ising Hamiltonian. We also identify the Mott-insulator to superfluid transition of the Bose-Hubbard Hamiltonian. The network approach to the analysis of quantum phase transitions provides us with a new set of tools to explore the many body physics of quantum phase transitions.

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David L. Vargas
Colorado School of Mines

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