

Talk 15, 14:00–

Scattering neutrons from magnons, spinons, solitons, and breathers

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Theoretically, numerically, and experimentally tractable, one dimensional quantum magnets have advanced our understanding of some of the most profound issues in quantum many body physics. In this talk I will review neutron scattering experiments that provide access to the dynamic two spin correlation function of a wide range of well defined one dimensional model systems. I will contrast results for integer and half odd integer spin systems with and without impurities. The unique quantum critical state of the uniform spin-1/2 chain is a nexus for a range of systems with widely varying physical properties. I shall discuss experiments on spin chains with a staggered field, alternating interactions, as well as frustrated spin ladders with and without an applied field to illustrate experimental signatures of the distinct quasi-particles mentioned in the title. Direct comparisons to theoretical results including those of Prof. Minoru Takahashi have been an essential guide in this work.