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Title: **New States of Magnetic Matter in Model Quantum Magnets**

Quantum spins in magnets show a remarkable diversity of new states of magnetic matter. Examples include clean realizations of exotic quantum ground states as in Bose-Einstein Condensates (BEC), Luttinger-liquids, and spin supersolids. In such system of localized spins with well-defined interactions quantum fluctuations are controlled efficiently by hydrostatic pressure, magnetic field, or chemical composition, leading to these complex novel states of matter. Magnetic insulators, e.g. quantum dimer magnets, can therefore be used as model systems for spectroscopic investigations of quantum criticality and, in particular, the ground states of strongly interacting hardcore bosons, for which there are increasing parallels to ultra-cold atoms in optical lattices. I will present results of fundamental pressure- and field-tuned quantum phase transitions investigated by neutron scattering and bulk experimental techniques in a series of model materials, which cover both the effect of dimensionality and the degree of quasi-particle mobility.