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Magnetic Phase Diagram of α -RuCl₃ JENNIFER SEARS, YOUNG-JUNE KIM, University of Toronto, YANG ZHAO, JEFFREY LYNN, NIST Center for Neutron Research — The layered honeycomb material α -RuCl₃ is thought to possess unusual magnetic interactions including a strong bond-dependent Kitaev term, offering a potential opportunity to study a material near a well understood spin liquid phase. Although this material orders magnetically at low temperatures and is thus not a realization of a Kitaev spin liquid, it does show a broad continuum of magnetic excitations reminiscent of that expected for the spin liquid phase. It has also been proposed that a magnetic field could destabilize the magnetic order in this material and induce a transition into a spin liquid phase. Low temperature magnetization and specific heat measurements in this material have suggested a complex magnetic phase diagram with multiple unidentified magnetic phases present at low temperature. This has provided motivation for our work characterizing the magnetic transitions and phase diagram in α -RuCl₃. I will present detailed bulk measurements combined with magnetic neutron diffraction measurements to map out the phase diagram and identify the various phases present.

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