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**Inelastic neutron scattering evidence for Kitaev quantum spin liquid physics in  $\alpha$ -RuCl<sub>3</sub><sup>1</sup>**

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The magnetic semiconductor  $\alpha$ -RuCl<sub>3</sub> is composed of very weakly coupled honeycomb layers of edge-sharing RuCl<sub>6</sub> octahedra. The Ru<sup>3+</sup> ion has 5  $d$  electrons in the low spin state, and the system is expected to have an effective  $J = \frac{1}{2}$  single ion ground state with an interacting spin Hamiltonian containing Kitaev-like terms. Inelastic neutron scattering [1] on powders and single crystals has been used to determine the energy scale of the magnetic interactions and the overall form of the magnetic fluctuations. The results indicate that the Kitaev term is significant. Moreover, detailed measurements of the response show evidence for the fractionalized excitations that are characteristic of the Kitaev quantum spin liquid.

[1] A. Banerjee *et al.*, arXiv:1504.08037.

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