

# 15th International Conference on Muon Spin Rotation, Relaxation and Resonance



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## Dipolar-Octupolar Quantum Spin Liquids in Ce-based Pyrochlores

*Wednesday, 31 August 2022 12:00 (40 minutes)*

In geometrically-frustrated Ce-based pyrochlores, such as  $\text{Ce}_2\text{Zr}_2\text{O}_7$ , the effective  $S=1/2$  of the  $\text{Ce}^{3+}$  crystal field ground state doublet is known to act both as a conventional dipole magnetic moment, and as an octupole. This constrains the form of its near-neighbour Hamiltonian, and allows for different ordered or quantum disordered ground states in this family of materials, where either the dipolar or octupolar nature of the  $S=1/2$  degree of freedom dominates. I will describe recent experiments [1,2], mostly neutron scattering and heat capacity, which show how the nature of the  $\text{Ce}^{3+}$  ground state doublet can be revealed, and how a particular form of quantum spin liquid can be identified as the likely ground state in  $\text{Ce}_2\text{Zr}_2\text{O}_7$ .

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