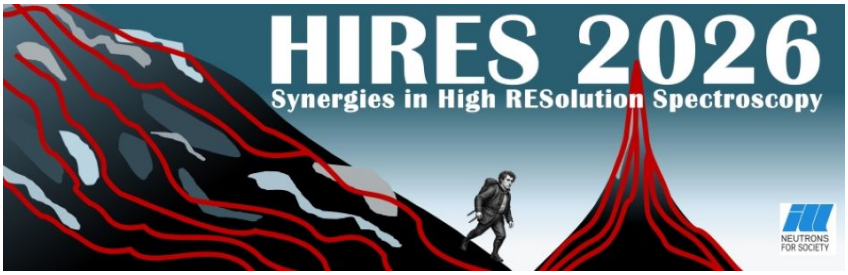

Contribution ID: **65** Type: **Poster**

Real-Time Magnetic Dynamics in a Frustrated Quantum Magnet Polymorph

Motivated by the growing effort to identify entangled quantum states in real materials, we investigate magnetic correlations across unprecedented energy and time scales in two archetypal frustrated spin-1/2 systems: a triangular-lattice antiferromagnet driven by geometric frustration, and a cubic-lattice antiferromagnet where frustration arises from quenched disorder. Both phases are realized in polymorphs of $Ba_3CoNb_2O_9$. Remarkably, we observe spin-liquid-like behavior in both cases, clearly distinct from classical long-range magnetic order or frozen spin-glass\ice states. These results provide the first direct time-domain evidence to address key open questions in quantum many-body physics (QMP), such as the reliability of long-time numerical predictions and the emergence of disorder-induced spin-liquid phases.

This poster highlights state-of-the-art approaches for probing real-time magnetic dynamics, combining complementary experimental methods with overlapping timescales: conventional Neutron Diffraction/Spectroscopy, Wide Angle Neutron Spin Echo, and Muon Spin Rotation. Our study provide new insights to QMP and point towards promising methodological development opportunities for the broader measurement-science community.

Session

Magnetism

Primary author: XU, Fanjun (HZB)

Presenter: XU, Fanjun (HZB)

Session Classification: Magnetism