Contribution ID: **65** Type: **Invited talk (by invitation only)**

Neutron scattering studies of two kagome magnets

Tuesday 6 January 2026 18:10 (35 minutes)

In a first part I will summarise results of an experimental study to unravel the magnetic ground state and interactions in $Co_3Sn_2S_2$, conducted with colleagues from PSI (Yona Soh) and the ILL (David Tam). By exploring the magnetic interactions to moderately high energies and using non-invasive probes to measure the magnetic ground state, we discover that the spin wave spectrum and low-energy spin gap can be completely characterized with a simple Hamiltonian dominated by one in-plane nearest-neighbor interaction, containing a Heisenberg component and a large antisymmetric Dzyaloshinskii-Moriya (DM) interaction. Our results can explain many crucial features of previous experimental reports without the need for additional phases or exotic exchange terms. Our results significantly simplify the basis of future modelling efforts in this prototypical kagome magnet.
In a second part I will introduce a new quaternary intermetallic compound discovered with colleagues from IJL (Thomas Mazet). In this material, Mn atoms form a perfect kagome lattice, but the shortest Mn-Mn distance is interlayer. I will show how this structure can lead to a peculiar hierarchy of interactions and to a new type of frustrated magnetic order. Our results suggest a general route by which frustrated interlayer couplings stabilize in-plane noncollinear order even in dominantly ferromagnetic kagome metals.

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