CONDENSED MATTER SCIENCES SEMINAR

Professor Robert McQueeney

Iowa State University

Host

Dr Mykhailo Shatruk

Title

Magnetism of the RT_6Sn_6 kagome metals

Friday, September 19th, 2025

1st Floor – B101

15:00-16:00

Abstract

Kagome metals are known for their unique electronic band structure containing flat bands and Dirac cones with topological character. This has elevated interest in kagome metals as an adaptable system to study the interplay of band topology with superconductivity, itinerant magnetism, and other charge instabilities that are driven by electronic correlations. In the RT_6Sn_6 kagome metals, conduction electrons within T=V, Mn kagome layers interact with the local magnetic moments of interleaved rare-earth (R) triangular layers. Here, I will describe experimental neutron scattering and high-field magnetization data outlining the competing magnetic interactions and magnetic fluctuations that lead to a variety of collinear and noncollinear magnetic phases when T=Mn. I will also discuss the discovery of strong Ising ferromagnetism in TbV_6Sn_6 and the search for potential transverse field quantum criticality.