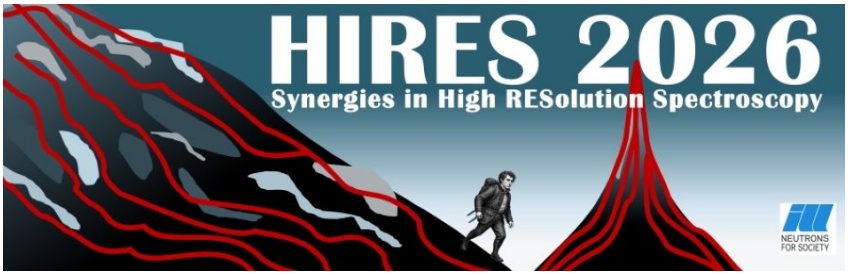

Contribution ID: **11** Type: **Poster**

Correlated Electron Dynamics and Magnetic Excitations in Topological and Intermetallic Quantum Materials

Understanding low-energy excitations and spin–charge correlations in quantum materials remains a key challenge in condensed matter physics. In this study, we investigate the magneto transport and structural properties of high-quality intermetallic single crystals (EuAuSb and DyMn6Sn6) alongside topological insulator thin films (Bi–Sb–Te–Se, BSTS) to explore the interplay between topology, magnetism, and electronic correlations. The intermetallic compounds exhibit complex magnetic ordering and anisotropic transport behavior arising from strong 4f–3d hybridization, while the BSTS thin films reveal weak antilocalization and linear magnetoresistance features associated with topologically protected surface states.

The combination of magneto transport data with high-resolution spectroscopic insights provides a comprehensive picture of charge carrier scattering and spin dynamics across these systems. We discuss the relevance of neutron-based techniques—such as spin-echo, backscattering, and TOF spectroscopy—for probing quasi elastic dynamics, magnetic fluctuations, and phonon–magnon interactions in such correlated systems. This approach emphasizes the powerful synergy between neutron spectroscopy and complementary transport and ARPES measurements in unraveling the microscopic origins of emergent quantum phenomena in intermetallic and topological materials.

Session

Hard Condensed Matter

Primary author: SHARMA, Vishnu (Indian institute of Technology (BHU) Varanasi)

Co-author: Prof. CHATTERJEE, Sandip (Indian institute of Technology (BHU) Varanasi)

Presenter: SHARMA, Vishnu (Indian institute of Technology (BHU) Varanasi)

Session Classification: Hard Condensed Matter