



INSTITUTE SEMINAR

Friday, 8 August 2014

4:00 pm

Fermion

Speaker:

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Title:

**Some exciting developments in superconducting
and multiferroic materials**

Abstract:

Layered chalcogenides have made a triumphant return to the center stage of superconducting material research in the recent past. In this talk we shall review the current status of superconductivity in three generic systems involving Sulfur (S), Selenium (Se), and Tellurium (Te). In all we shall discuss synthesis and detailed electromagnetic characterization of four compounds; the topological crystalline superconductor $\text{Sn}_{0.5}\text{In}_{0.5}\text{Te}$, the copper intercalated topological insulator Bi_2Se_3 , the BiS_2 based $\text{Bi}_4\text{O}_4\text{S}_3$ and the quintessential $\text{FeSe}_x\text{Te}_{1-x}$. Along with estimation of fundamental parameters such as upper critical field anisotropy and coherence length, we shall summarize results from temperature dependent Hall and Seebeck coefficient measurements. Of particular interest are the results from temperature dependent RF penetration depth study that provide evidence for varied pairing symmetry in $\text{Sn}_{0.5}\text{In}_{0.5}\text{Te}$ vis à vis $\text{Bi}_4\text{O}_4\text{S}_3$. With regard to multiferroic materials, we shall focus on oxides where ferroelectricity is driven by cycloidal magnetic orderings rather than ab-initio non-centrosymmetric crystal structure. The examples would include Y_2CoMnO_6 , NdCrTiO_5 , and $\text{Cu}_3\text{Nb}_2\text{O}_8$.

References

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