

## **Internal Seminar**

### **Electron transport in thin films and heterostructures of a non-collinear antiferromagnet**

**Joynarayan Mukherjee**

**TIFR, Hyderabad**

Non-collinear antiferromagnets (NCAFM) have attracted a great attention to the scientific community due to its interesting hexa-triangular (Kagome) spin arrangement in the lattice. The Kagome structure gives rise to many exotic phenomena due to their non-vanishing berry curvature, linearly dispersive Weyl cones and flatbands. The finite berry curvature leads to many exotic phenomena such as anomalous Hall effect (AHE), spin Hall effect (SHE), topological Hall effect (THE), anomalous Nernst effect (ANE) and magneto-optical Kerr effect (MOKE) etc.

Epitaxial thin films of a NCAFM ( $Mn_3Pt$ ) were grown on STO (100) substrate using co-sputtering technique. We observe interesting angle dependence of magnetoresistance showing chiral anomaly at low temperature which reveals the presence of linearly dispersive Weyl cones in 25 nm  $Mn_3Pt$  film. Moreover, differential conductance revealed flatband induced zero bias conduction peak in heterostructure of  $Mn_3Pt/Ta$  which is very robust up to 7 T magnetic field. We have also carried out transport experiments on  $Mn_3Pt$  polycrystalline thin films, grown on Si/SiO<sub>2</sub> substrates and observed sign reversal in anomalous Hall conductivity and magnetoresistance at low temperature. We attribute this sign reversal could be due to the rotation of Mn moments at low temperature regime.

***Friday, Mar 13<sup>th</sup> 2020***

***2:30 PM (Tea/Coffee at 2:00 PM)***

***Seminar Hall, TIFR-H***