ICTS Skype Seminar

Title : "Beyond Graphene" – novel topological phenomena in Weyl semimetals and some 2D semiconductors

Speaker : Girish Sharma, Virginia Polytechnic Institute & State University, USA

Date : Thursday, 14 December 2017

Time : 11:00 AM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : Certain condensed matter systems exhibit quasiparticle excitations, which can be very well captured by the Dirac equation-a famous example being that of Graphene. Weyl and Dirac semimetals are 3D analogues of Graphene, and exhibit anomalous transport and optical phenomena on account of its non-trivial band topology. In the first part I will discuss Weyl and Dirac semimetals, and will highlight my contributions in this field uncovering their anomalous responses such as predicting signatures of chiral anomaly and the Berry curvature. The massive Dirac equation in two dimensions can also describe low energy effective Hamiltonian of transition metal dichalcogenides (TMDs) which are 2D mono-layered semiconducting materials. In the second part I will discuss TMDs and highlight my work relating to YSR states in the superconducting counterpart of these materials, and also the important role nuclear spins may play in determining properties of TMD semiconductors.