

# Open Talk

23<sup>rd</sup> May 2019

4:00 PM

Fermion

SPEAKER

**Ms. Ayana Mukhopadhyay**

IIT, Bhubaneswar

TITLE OF THE TALK

**Magnetic and transport Properties of ternary half-Heusler compounds, RPdX (R=Rare earths, X=Bi, Sb and Si)**

ABSTRACT

Recently ternary half-Heusler compounds (THH) have attracted a lot of research interest in the field of Condensed matter physics and Material Sciences due to their diverse functionalities. One of the most remarkable characteristics of these compounds is the tunability of band gap from zero to 4eV by means of chemical substitution or strain engineering. Due to this flexibility of tuning band gap, THH can exhibit metallic, semimetallic, semiconducting and superconducting behaviour. Among different THH, the rare earth based heavy element containing THH are promising because of their low band gap, high spin orbit coupling and localised magnetism. In addition to that, these compounds host several extraordinary properties, such as Kondo effect, heavy Fermionic behaviour, thermoelectricity, giant magnetoresistance, topological insulating property, Weyl Fermionic behaviour, high magnetocaloric efficiency.

In this talk, I will discuss about the results of experimental investigations on multifunctional properties of rare earth based THH family RPdBi, RPdSb and RPdSi (R= Rare earths). Our studies were mostly directed towards the study of magnetic, magnetocaloric, electric transport, magnetoresistance (MR) and Hall effect as a function of temperature and magnetic field. The most notable outcome among all investigations are the anomalous Hall resistivity of DyPdBi, unusual MR behaviour of RPdSb compounds with variation of rare earths, large change of magnetocaloric entropy for HoPdSb and ErPdSb compounds at low temperatures and several field induced magnetic transitions for RPdSi compounds.

HOST FACULTY

**Dr. Thirupathaiiah Setti**

Assistant Professor

Department of Condensed Matter Physics & Material Sciences

**S. N. Bose National Centre for Basic Sciences**