

Seminar

Institute for Plasma Research

- Title :** Temperature and Magnetic Field Induced Effects on Functional Magnetic Materials
- Speaker :** Dr. Archana Lakhani
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- Date :** 7th September 2015 (Monday)
- Time :** 3.30 PM
- Venue :** Committee Room 4 (New Building), IPR

Abstract:

The low temperature and high magnetic field environment is a powerful method for revealing the multifaceted behavior found in functional magnetic materials. The coupling of conduction electrons and magnetic moments in the presence of magnetic field due to their strong correlations at low temperature show various interesting properties in functional magnetic materials. The ferromagnetic shape memory alloys (FSMAs) with general formula $Ni_{50}Mn_{50-y}X_y$ ($X=In, Sn$ and Sb) belong to the class of magnetic materials having interesting functional behavior associated with the application of magnetic field. The high temperature phase of this material is a ferromagnetic austenite (FM-A) phase, while the low temperature phase is low magnetization martensitic (LM-M) phase. This magneto structural transition is very sensitive to the field, pressure, and composition, which makes them a good candidate for multifunctional applications. The functional performance of FSMAs like in transducers, actuators, and switching devices is associated with the first order structural transition known as martensitic transition (MT). Apart from the technological importance of FSMAs, they are also very good candidates for fundamental studies in the field-temperature (HT) phase space. The interest in diluted rare earths like Dy, Tb and Ho is revived due to rich physics involved. These rare earth alloys show various magnetic states with the influence of magnetic field in different ranges of temperatures. In this talk the brief introduction to some of the low temperature and high field facilities available at CSR Indore and interesting latest results on magneto transport and magnetization of ferromagnetic shape memory alloys (FSMAs) and diluted rare-earth alloys would be discussed.
