

Seminar

Institute for Plasma Research

Talk1 : New concepts in 1st order transitions

Speaker : Prof. Praveen Chaddah

Ex-Director of the UGC-DAE Consortium

Date : 5th April 2017 (Wednesday)

Time : 03.30 PM

Venue : Seminar Hall, IPR

Talk2 : Studies on magnetic transitions

Speaker : Prof. Praveen Chaddah

Ex-Director of the UGC-DAE Consortium

Date : 6th April 2017 (Thursday)

Time : 03.30 PM

Venue : Seminar Hall, IPR

Abstract :

1st order magneto-structural transitions have many application possibilities utilizing magnetoresistance, magnetocaloric effect, magnetic shape memory effect, and magneto-dielectric effect. Magnetic field induced transitions [H replaces pressure P] gained prominence with the observation of phase coexistence in half-doped manganites. Following experimental studies invoking novel paths in [H,T] space, researchers at Indore pushed an alternative view that this phase coexistence could be due to glasslike arrest of the underlying first order magnetic transition. We shall discuss our prediction, and observations, of the path-dependence of such coexisting phase fractions. We shall show how this has led to new concepts, and to a subtle but major shift in the experimental characteristics used in defining first order transitions. We shall conclude with our proposal that that glass-formation is dictated by the coupling of latent heat to the thermal conduction process, and our explanation for the Mpemba effect that hot water can freeze faster than cold water.
