

Seminar

Institute for Plasma Research

Title : Exploring strong coupling phenomena in classical many body systems: from dusty plasma to colloids

Speaker : Dr. Manis Chaudhuri
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Date : 19th April 2016 (Tuesday)

Time : 11.00 AM

Venue : Seminar Hall, IPR

Abstract:

Soft matter is a growing interdisciplinary research area which provides a fascinating testing ground to investigate fundamental questions in condensed matter physics, as for example, many-body statistical physics, phase transition, topological defects, hydrodynamics, and many more. In recent times, strongly coupled dusty plasmas (plasma crystal and liquid) are being considered as the plasma state of soft matter which shares unique complementary features with colloids. Unlike colloids where the particle dynamics is overdamped due to the presence of viscous solvents, the background weakly ionized gas makes almost undamped particle dynamics in dusty plasmas. Both these systems can be used to explore strong coupling phenomena at the “atomistic level” due to experimental simplicities. Hard sphere colloids have been used extensively for a long time where volume fraction is the only controlling parameter to explore phase space. However, more interesting features are associated with soft colloids where the softness of inter-particle interactions can be tuned by charge or polymers grafted on the particle surface. In this presentation, my works on dusty plasmas will be discussed in the first part and the second part will cover my present research activities with soft colloids.
