# Seminar

# Institute for Plasma Research

**Title :** Nonlinear Pumping, Finite Temperature and Magnetic Shear Induced Stabilization Of Multiple Instabilities In Convective Fluid Plasma Transport Scenario

**Speaker:** Dr. J.K. Atul
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**Date :** 22nd July 2019 (Monday)

**Time :** 03:00 PM

**Venue :** Committee Room 4, (New Building), IPR

## Abstract :

Simultaneous existence of multiple instabilities has been reported in various linear plasma devices [1-5], toroidal devices [6-8] as well as in space plasma systems [9-12]. The interplay between these participating modes and the associated wave particle interactions are significantly influenced by dominant drivers as well as free energy sources/sinks for a given plasma system. The relative suppression mechanism and hierarchy of these instabilities needs to be critically investigated with respect to plasma confinement scenario. In context with it, the collective influence of nonlinear pump, finite temperature and sheared magnetic field is studied investigated for the EXB (and/or gravitational) and the current convective instabilities (CCI) to visualize local and global fluid flow patterns in slab geometry configuration. Further, global mix-mode potential eigen-mode structure suggests mode localization off the rational surface due to equilibrium parallel dynamics. It turns out that the magnetic shear induced stabilization is more effective at the larger scale sizes whereas finite temperature induced stabilization is more dominant at the smaller scale sizes. Nonlinear ponderomotive pumping and nonlinear thermal pumping for the post mode converted electrostatic pump frequency have also been incorporated in the standard Four wave parametric coupling scheme.

**References-**

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