

# Seminar

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## Institute for Plasma Research

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**Title :** Study of novel features in laser-plasma interactions

**Speaker:** Mr. Atul Kumar

Institute for Plasma Research, Gandhinagar

**Date :** 22nd April 2019 (Monday)

**Time :** 03:30 PM

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

### **Abstract :**

The electromagnetic fields of laser readily interact with plasma medium which is constituted by charged particles, namely electron and ions. The short pulse intense lasers couple their energy efficiently with the lighter electron species of the plasma medium creating highly energetic electrons. These energetic electrons are important as they carry energy imparted by the laser to over dense regions in the plasma which otherwise is inaccessible by lasers. The thesis explores various physics aspects of laser generated energetic electron propagation in plasmas. These include the energetics associated with the well-known instabilities in the context of beam plasma medium, the creation and evolution of magnetic fields, the effect of finite beam size resulting from the finite focal spot of lasers, etc. Secondly a new mechanism of efficient coupling of lasers to the heavier ion species by lasers has been shown wherein the motion of electrons has been restricted by making the electrons magnetized by adding external magnetic field.

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