Seminar

Institute for Plasma Research

Title :Three Fluid Effects in Magnetic field Generation
Speaker : Prof. Vinod Krishan
Indian Institute of Astrophysics, Bangalore
Date : 13th November, 2019 (Wednesday)
Time : 11.00 AM
Venue : Seminar Hall, IPR

Abstract:

All celestial objects are endowed with a magnetic field. Generation mechanisms of magnetic field are invoked in order to compensate for their dissipation inherent in a plasma. The first level of understanding of a generation mechanism is achieved in the framework of the magnetohydrodynamics. One of the most favoured mechanisms is the Mean Field Dynamo operating in the presence of turbulence and the fluid flow shear, abbreviated as the Alpha- Omega dynamo. This serves well in a fully ionized plasma. However, in a weakly ionized plasma predominantly containing neutral particles, there are additional contribution to the dynamo process due to ion-neutral collisional coupling in the form of Ambipolar Diffusion. In this talk, I would discuss the essentials of the mean field dynamo including the Hall effect and the ambipolar diffusion effect and point out their importance in modeling the solar magnetic field.