

Date: November 11th, 2005

Time: 11:00 AM

Location: Maryland Hall 110

Speaker: Dr. W. H. Matthaeus
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Title: “Turbulence in the Interplanetary Medium”

Abstract

While the details of the origin of the solar wind in the lower corona remain a puzzle, the supersonic solar wind and the turbulent fluctuations carried with it have become one of the best studied cases of strong plasma turbulence, often studied in the magnetohydrodynamic (MHD) approximation. As a natural laboratory for MHD turbulence, the solar wind is a testing ground for various ideas about evolution and cascade of turbulence and for studying turbulence effects such as heating, modification of observed wave-like properties, generation of spectral anisotropy, and scattering of charged test particles. Here we review the basic features of the large scale and turbulent solar wind and provide theoretical and observational discussion of some of its important features. This understanding has led to the prospect of developing a predictive theory that explains the large scale evolution of MHD turbulence throughout the heliosphere. This is necessary if we are to understand the solar system plasma environment, including, for example, the distribution of galactic cosmic rays in the solar system.