

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

A Unified Model of Astrophysical Plasma Turbulence GREGORY HOWES, University of Iowa — Turbulence profoundly affects particle transport and plasma heating in many astrophysical plasma environments, from galaxy clusters to the solar corona and solar wind to Earth's magnetosphere. Two seemingly incompatible models presently dominate plasma turbulence research: one views plasma turbulence as a sea of nonlinearly interacting Alfvén waves, while the other focuses on the development of current sheets and their role as sites of enhanced dissipation. Here the generation of current sheets is shown to be a natural consequence of strong Alfvén wave collisions, explained by constructive interference among the initial waves and nonlinearly generated modes. This discovery resolves the dichotomy between wave and coherent-structure models of plasma turbulence, leading to the expectation that Landau damping of the constituent Alfvén waves plays a role in current sheet dissipation.

Gregory Howes
University of Iowa

Date submitted: 22 Jul 2015

Electronic form version 1.4