

Theoretical Plasma Dynamics & the Space Weather

Theoretical explorations of prime plasma phenomena underlying some aspects of space weather such as magnetospheric substorms and solar flares are in progress. Two such phenomena are magnetic field reconnection and magnetohydrodynamic (MHD) turbulence which have been designated by the National Research Council as high priority yet poorly understood areas. Our magnetic reconnection research has provided the theoretical framework for some aspects of the Princeton Magnetic Reconnection Experiment. Our MHD turbulence research has predicted some prime features in the recent *in situ* European multi-satellite observations in the magnetospheric cusp region. See <http://arXiv.org/shivamoggi> for further details.