

Title of my talk: Atypical particle heating at a supercritical interplanetary shock

Abstract:

We present the first observations at an interplanetary shock of large amplitude (> 100 mV/m pk-pk) solitary waves and large amplitude (~ 30 mV/m pk-pk) waves exhibiting characteristics consistent with electron Bernstein waves. The Bernstein-like waves show enhanced power at integer and half-integer harmonics of the cyclotron frequency with a broadened power spectrum at higher frequencies, consistent with the electron cyclotron drift instability. The Bernstein-like waves are obliquely polarized with respect to the magnetic field but parallel to the shock normal direction. Strong particle heating is observed in both the electrons and ions. The observed heating and waveforms are likely due to instabilities driven by the free energy provided by reflected ions at this supercritical interplanetary shock. These results offer new insights into collisionless shock dissipation and wave-particle interactions in the solar wind.