

## **Theory Presentations at the First Meeting**

### **ISSI Team on Observations and Theories of Suprathermal Tails and ACRs**

**(as of August 26, 2009)**

**Len Fisk:** The Fisk/Gloeckler theory for the formation of suprathermal tails with spectral index of -5.

**Randy Jokipii:** The basics of the Parker equation, assumptions, etc. Standard derivation of transport in stochastic compressions and rarefactions from Parker's equation, noting conservation-law form in phase space. A brief review and critique of previous work on compression acceleration by Ptuskin, Jokipii et al., Webb, et al., Fisk & Gloeckler. The required parameters -- mean free path, time scales, etc and some comparison with observations of anisotropies, composition of ACR, etc.

**Marty Lee:** Green's function for isotropic stochastic acceleration; criticism of the stochastic transport equation derived in Fisk & Gloeckler (2008); other types of stochastic acceleration; the origin of the suprathermal tails; and the origin of the termination shock particles observed by Voyager.

**Hans Fahr:** The pressure in the (-5) tails and a theory for (-4) tails.

**Vladislav Izmodenov:** TBD

**Jakobus le Roux:** The modeling of the acceleration of core interstellar pickup ions with a time-dependent focused transport equation at the nearly perpendicular termination shock can in principle explain many of the observed characteristics of the TSP particles. The stochastic acceleration of pickup ions by compressive fluctuations can produce a  $f(v)$  proportional to  $v^{-5}$  spectrum, but only under special conditions. It will be discussed whether these conditions are feasible in the solar wind.

**Nathan Schwadron:** Acceleration of ACRs at the Blunt Termination Shock, with amplification of power-law tails by compressions in the heliosheath; also including recent results by Josef Kota, as presented at SHINE.