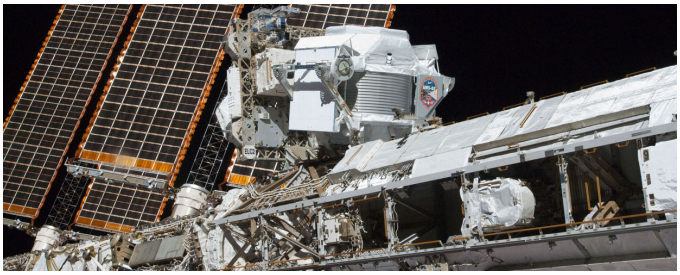

Contribution ID: **7** Type: **not specified**

It's About Time: Interpreting AMS Antimatter Data in Terms of Cosmic Ray Propagation

Wednesday, 15 April 2015 16:15 (45 minutes)

If cosmic ray positrons come from a secondary origin, then their production spectrum is correlated with the production spectrum of other secondary particles such as boron and antiprotons through scattering cross sections measured in the laboratory. This allows to define a first-principle upper bound on the positron flux at the Earth, independent of propagation model assumptions. Using currently available B/C and antiproton/proton data, we show that the positron flux reported by AMS is consistent with the bound and saturates it at high energies. This coincidence is a compelling indication for a secondary source. We explain how improved AMS measurements of the high energy boron, antiproton, and secondary
radioactive nuclei fluxes can corroborate or falsify the secondary source hypothesis. Assuming that the positrons are secondary, we show that AMS data imply a propagation time in the Galaxy of order 1Myr or less for cosmic rays with magnetic rigidity > 300 GV. This corresponds to an average traversed interstellar matter density of ~ 1 particle/cc, comparable to the density of the Milky Way gaseous disk.

Presenter: Dr BLUM, Kfir (Institute for Advanced Study, Princeton)