HAO Colloquium Series

(Refreshments served)

Speaker: **Richard Mewaldt, Cal Tech**

Time: **1:30–2:30 pm**

Date: **Wednesday, January 23, 2013**

Location: **CG1-1210 South Auditorium**

Title: **New Views of Solar Energetic Particle Events from STEREO and L1**

Abstract:

Solar energetic particles (SEPs) are accelerated to energies of hundreds of MeV in large solar flares and also by fast coronal mass ejections associated with these flares. During the rise in solar activity in 2010-2012, STEREO and near-Earth spacecraft (ACE, GOES, SDO, SOHO, and Wind) have provided ~360° coverage of SEP events, CMEs, interplanetary shocks, and other aspects of solar eruptions. This combination has provided an unprecedented opportunity to observe how the properties of ~0.1 to ~100 MeV SEP events vary with longitude. Initial results indicate that energetic particles are distributed in longitude more easily than was earlier appreciated. Indeed, most large SEP events associated with CME-driven shocks are observed by both STEREOs and ACE at the inner Lagrangian point (L1), even when these spacecraft are separated by >100° in longitude. Suggested explanations for the rapid spread of SEPs in longitude will be discussed.

The longitudinal distribution and observed energy spectra are key parameters in determining the kinetic energy content of solar energetic particles. A recent paper by Emslie et al. discusses the global energetics of 38 large solar eruptive events. I will compare the energy content of ~30 keV/nucleon to ~300 MeV/nucleon SEPs observed in interplanetary space with that of the associated CMEs and flares, and consider why the acceleration efficiency of SEP events varies from event to event.

Finally, now that we are well into solar cycle 24, it is of interest to compare how several measures of solar activity in the current cycle differ from those in solar cycle 23.