HAO Colloquium Series

(Refreshments served)

Speaker: **Mary Hudson, Dartmouth College**

Time: **3:00–4:00 pm**

Date: **Wednesday, August 7, 2013**

Location: **CG1-2126 (No webcast. Recording will be available)**

Title: **Modeling the radiation belt electron response to CME-driven storms: the first 9 months of the Van Allen Probes**

Abstract:

Recent geomagnetic storms at solar maximum have produced dynamic variations in outer zone radiation belt electron flux measured in detail by the Van Allen Probe twin spacecraft, launched August 30, 2013. Both enhanced flux and sudden dropouts have been observed, which characterize CME-driven storms dominating variability around solar maximum. High time resolution measurements of waves which modulate that variability are also made by the Van Allen Probes. In addition to strong evidence of prompt magnetopause loss provided by the Van Allen Probes and THEMIS spacecraft, enhanced atmospheric precipitation has been observed by the Balloon Array for RBSP Relativistic Electron Losses (BARREL), launched from Antarctica in January to mid-February 2013. Results will be shown from modeling flux enhancements due to plasmasheet electron injection during the October 7 – 9 storm, which produced the largest enhancement seen since launch, along with ULF wave mediated magnetopause loss and loss to the atmosphere. The technique described follows electron test particles in global MHD fields using the Lyon-Fedder-Mobarry MHD code driven by upstream solar wind measurements. Plasmasheet electrons can be transported inside geosynchronous orbit, acquiring energies ~ 1 MeV, after loss to the magnetopause and to the atmosphere depletes the outer zone immediately following the arrival of CME shocks. The cycle of flux dropout and enhancement during storm intervals is followed by radial diffusion over quiet periods, which can be modeled by a diffusion code.