



## HAO Colloquium Series

(Refreshments served)

**Speaker:** Kathrin Haeusler, HAO

**Time:** 1:30–2:30 pm

**Date:** Wednesday, February 6, 2013

**Location:** CG1-2126

**Title:** The geospace response to nonmigrating tides

### **Abstract:**

Numerous observations and model studies made during the past six years have unequivocally revealed that geospace owes a considerable amount of its longitudinal, local time, seasonal/latitudinal and day-to-day variability to solar atmospheric tides from the lower atmosphere. An unexpected and new realization was the discovery that tropospheric weather is important for the “space weather” of the ionosphere-thermosphere-mesosphere (ITM) system, with tides being the main coupling mechanism. The presentation focuses on the results obtained by the CHAMP satellite concerning nonmigrating tidal signals in the zonal wind. The CHAMP mission provided 9 years of continuous and globally distributed measurements of the upper atmosphere in the altitude range of ~450 km at the beginning of the mission to ~250 km in the final days. Inter-annual and latitudinal variations as well as solar flux dependences are presented for the various nonmigrating tides observed in the CHAMP zonal wind. They are further compared to the predictions of an empirical model based on Hough Mode Extensions which are fitted to tides observed by TIMED around 100 km altitude. Therewith Hough Mode Extension modeling is a powerful tool to bridge the data gap between satellite measurements performed in the mesosphere, lower thermosphere region and the upper thermosphere.