HAO Colloquium Series

(Refreshments served)

Speaker: **Liang Zhao, HAO/NCAR**

Time: **1:30 pm**

Date: **Wednesday, May 4, 2011**

Location: **CG-1, South Auditorium**

Title: **Understanding the behavior of the Heliospheric magnetic field and the solar wind during the unusual solar minimum between Cycles 23 and 24**

Abstract: The properties of the heliospheric magnetic field and the solar wind were substantially different in the unusual solar minimum between Cycles 23 and 24: the magnetic-field strength was substantially reduced, as were the flow properties of the solar wind, such as the mass flux. Explanations for these changes are offered that do not require any substantial reconsiderations of the general understandings of the behavior of the heliospheric magnetic field and the solar wind that were developed in the Cycle 22/23 minimum. Solar-wind composition data are used to demonstrate that there are two distinct regions of solar wind: solar wind likely to originate from the stalk of the streamer belt (the highly elongated loops that underlie the heliospheric current sheet), and solar wind from outside this region. The region outside the streamer-stalk region is noticeably larger in the Cycle 23/24 minimum; however, the increased area can account for the reduction in the heliospheric magnetic-field strength in this minimum. Thus, the total magnetic flux contained in this region is the same in the two minima. Various correlations among the solar-wind mass flux and coronal electron temperature inferred from solar-wind charge states were developed for the Cycle 22/23 solar minimum. The data for the Cycle 23/24 minimum suggest that the correlations still hold, and thus the basic acceleration mechanism is unchanged in this minimum.