HAO Colloquium Series
(Refreshments served)

**Speaker:** Piyali Chatterjee, HAO

**Time:** 1:30–2:30 pm

**Date:** Wednesday, January 8, 2014

**Location:** CG1 – 1210 South Auditorium (also webcast at [http://www.fin.ucar.edu/it/mms/cg-live.htm](http://www.fin.ucar.edu/it/mms/cg-live.htm))

**Title:** Occurrences of fast and possibly cannibalistic coronal mass ejections: insights from flux rope simulations

**Abstract:**

We present results from magnetohydrodynamic simulations of the development of homologous sequence of coronal mass ejections (CMEs) and demonstrate their so-called cannibalistic behavior. These CMEs originate from the repeated formations and partial eruptions of kink unstable flux ropes as a result of continued emergence of a twisted flux rope across the lower boundary into a pre-existing coronal potential arcade field. Our simulation shows that a CME erupting into the open magnetic field created by a preceding CME has a higher speed. The second of the three successive CMEs in one of the simulations is cannibalistic, catching up and merging with the first into a single fast CME before exiting the domain. All the CMEs including the leading merged CME, attained speeds of about 1000 km s⁻¹ as they exit the domain. The reformation of a twisted flux rope after each CME eruption during the sustained flux emergence can naturally explain the X-ray observations of repeated reformations of sigmoids and "sigmoid-under-cusp" configurations at a low-coronal source of homologous CMEs. We also investigate the initiation mechanism of these energetic CMEs as a function of the twist parameter of the flux rope.