



HAO Colloquium Series

(Refreshments served)

Speaker: Mei Zhang, Natl. Astronomical Observatory,
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Time: 3:00–4:00 pm

Date: Wednesday, June 20, 2012

Location: CG1-2126

Title: Consequences of Magnetic Helicity Accumulation in the
Corona

Abstract:

Abundant observations have shown that magnetic fields emerging on the solar photosphere obey a hemispheric helicity sign rule, that is, positive helicity sign in the southern hemisphere and negative in the northern hemisphere. This observational rule, together with the theoretical concept that the total magnetic helicity is approximately conserved in the corona, leads to a natural result that the total magnetic helicity is accumulated in the corona. In this talk I will present our understandings on what are the possible consequences of magnetic helicity accumulation in the corona. We show that magnetic flux ropes will form in the corona as a result of Taylor relaxation; coronal mass ejections will take place due to the existence of an upper bound on the total magnetic helicity of force-free fields; and finally Parker-spiral-like structures will present in the interplanetary space to accommodate the large amount of magnetic helicity ejected from the low corona.