



HAO Colloquium Series

(Refreshments served)

Speaker: Tim Bastian, NRAO

Time: 1:30–2:30 pm

Date: Wednesday, September 25, 2013

Location: CG1 – 2126 (also webcast at
<http://www.fin.ucar.edu/it/mms/cg-live.htm>)

Title: Fast Radio Imaging Spectroscopy of the Sun - Recent Examples and Future Prospects

Abstract:

Radio observations offer a number of diagnostics of the solar corona and active phenomena therein. This talk provides a brief overview of these diagnostics and will then focus on recent work using dynamic spectroscopy and interferometry to place new constraints on the coronal plasma environment. Two examples are discussed: in the first, the FASR Subsystems Testbed (FST) was used to observe a "zebra pattern" radio burst during the powerful X1.5 flare on 2006 December 14. Interferometric techniques provided new spatial constraints on the source, leading us to conclude that the pattern was the result of a double plasma resonance. This, in turn, allowed us to constrain both the magnetic field and plasma density in the source. In the second example, observations from the recently upgraded Very Large Array are presented. In particular, the trajectories of type III radio bursts resulting from nonthermal electron beams propagating up into the corona during a soft-X-ray jet event are presented, as is the coincident hard-X-ray signature of the corresponding downward-propagating electrons. The observations are used to show that the corona over the source is extremely inhomogeneous transverse to the magnetic field. Future prospects for imaging spectroscopic techniques are briefly discussed.