



## **The COronal Solar Magnetism Observatory (COSMO) Large Aperture Coronagraph**

Steve Tomczyk (1), Dennis Gallagher (1), Zhen Wu (2), Haiying Zhang (2), Pete Nelson (3), Joan Burkepile (1), Don Kolinski (1), and Lee Sutherland (1)

(1) High Altitude Observatory, National Center for Atmospheric Research, (2) Nanjing Institute for Astronomical Optics and Technology, (3) Sierra Scientific Solutions

The COSMO is a facility dedicated to observing coronal and chromospheric magnetic fields. It will be located on a mountaintop in the Hawaiian Islands and will replace the current Mauna Loa Solar Observatory (MLSO). COSMO will provide unique observations of the global coronal magnetic fields and its environment to enhance the value of data collected by other observatories on the ground (e.g. SOLIS, BBO NST, Gregor, ATST, EST, Chinese Giant Solar Telescope, NLST, FASR) and in space (e.g. SDO, Hinode, SOHO, GOES, STEREO, Solar-C, Solar Probe+, Solar Orbiter). COSMO will employ a fleet of instruments to cover many aspects of measuring magnetic fields in the solar atmosphere. The dynamics and energy flow in the corona are dominated by magnetic fields. To understand the formation of CMEs, their relation to other forms of solar activity, and their progression out into the solar wind requires measurements of coronal magnetic fields. The large aperture coronagraph, the Chromospheric and Prominence Magnetometer and the K-Coronagraph form the COSMO instrument suite to measure magnetic fields and the polarization brightness of the low corona used to infer electron density. The large aperture coronagraph will employ a 1.5 meter fused silica singlet lens, birefringent filters, and a spectropolarimeter to cover fields of view of up to 1 degree. It will observe the corona over a wide range of emission lines from 530.3 nm through 1083.0 nm allowing for magnetic field measurements over a wide range of coronal temperatures (e.g. FeXIV at 530.3 nm, Fe X at 637.4 nm, Fe XIII at 1074.7 and 1079.8 nm). These lines are faint and require the very large aperture. NCAR and NSF have provided funding to bring the large aperture coronagraph to a preliminary design review state by the end of 2013. As with all data from Mauna Loa, the data products from COSMO will be available to the community via the Mauna Loa website: <http://mlso.hao.ucar.edu>