

**THE CORONAL SOLAR MAGNETISM OBSERVATORY (COSMO).** S. Tomczyk<sup>1</sup> and S. E. Gibson<sup>1</sup>, <sup>1</sup>High Altitude Observatory, National Center for Atmospheric Research (3090 Center Green Dr., Boulder, CO 80301; tomczyk@ucar.edu, [sgibson@ucar.edu](mailto:sgibson@ucar.edu)).

**BRIEF SUMMARY:** The COSMO suite of instruments will take continuous daytime synoptic measurements of magnetic fields in the solar corona and chromosphere, in order to understand solar eruptive events that drive space weather.

**ABSTRACT:**

Magnetism is the dominant force in the solar corona. It plays a key role in structuring the corona on all spatial scales, in heating the corona, and accelerating the solar wind. The storage and release of magnetic free energy in the corona powers solar eruptions that are responsible for space weather with serious consequences for our technological society. Daily synoptic measurements of the magnetic structure of the global solar corona are needed to advance our understanding of these critical physical processes and to enable a predictive capability of solar eruptive events.

The COronal Solar Magnetism Observatory (COSMO) is a unique ground-based facility designed to address current shortfalls in our capability to measure magnetic fields in the solar corona. COSMO comprises three elements. The first two focus on chromospheric and prominence magnetometry (ChroMag), and observing the electron scattered K-corona (K-Cor). The third and central instrument is the 1.5-m aperture Large Coronagraph (LC) that will continuously observe the radiation emitted by the corona in a number of visible and near-IR emission lines. The COSMO-LC is currently undergoing its final design, as part of the NSF-funded COSMO Site and Design Advancement (COSADA) project, which is also evaluating several candidate sites for COSMO.

NCAR developed COSMO in partnership with the University of Michigan, the University of Hawaii, George Mason

University, the Smithsonian Astrophysical Observatory, the University of Colorado, and the National Solar Observatory, along with other support in the solar community.

