

CCAT

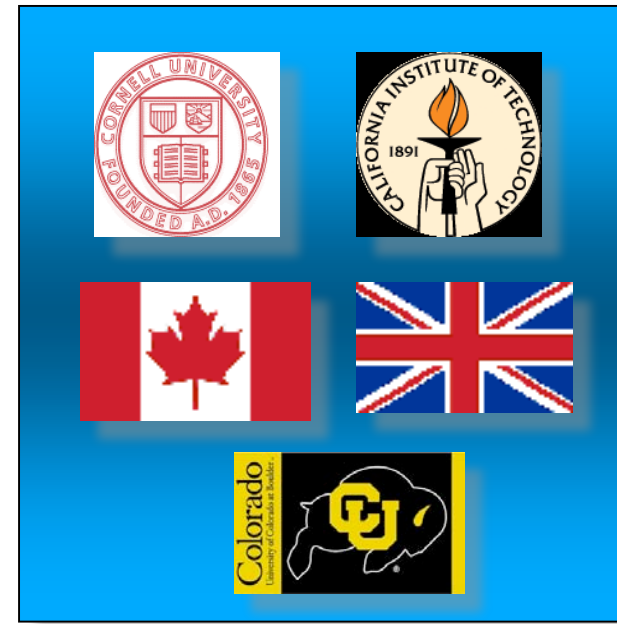
# The CCAT News

The Cornell Caltech Atacama Telescope

Issue 4 April 2007

## CCAT Interim Consortium Agreement Nears Completion

Negotiations over language of the Interim Consortium Agreement (ICA) which will govern the next phase of CCAT development are virtually complete. Cornell and Caltech have signed the agreement and the necessary administrative approvals at the remaining three current partners (Canada, the UK, and U. Colorado) are pending. This agreement makes provision for a governing Interim Board, establishes the process for development of the full partnership agreement, and mandates the first cash contributions to common accounts. Under this agreement it is anticipated that formal Chilean authorization for use of the Atacama site will be sought and the next levels of technical



The Five Current CCAT Partners

development will be achieved. Discussions with additional high profile prospective partners continue. Those wishing additional information may contact Riccardo Giovanelli ([riccardo@astro.cornell.edu](mailto:riccardo@astro.cornell.edu))



ATK Composites FIRST prototype mirror: CFRP composite mirrors of 2 meters size and micron level accuracy are within the state of the art

## Progress in Primary Mirror Development

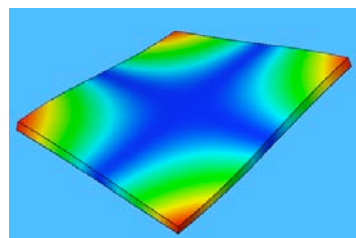
In January of this year a CCAT Optics Working Group (OWG) was formed. This group has focused on the critical issues of manufacture of optics for CCAT including primary mirror panels and the secondary and tertiary mirrors. Visits have been made to four different composites manufacturers with experience in fabrication of precision reflectors for space based communications satellites. Visits have also been made to composites tooling fabricators investigating manufacture of precision Invar tooling for composite reflector panels. JPL work on the Precision Segmented Reflector program in the late 1990's showed that composite/Al sandwich construction could produce mirror panels of the quality required for CCAT.

Investigations of mold technologies indicate that molds of graphite, Invar, or low expansion glasses could provide the needed dimensional stability during fabrication of optics. Visits to Zeiss and Leitz in Germany have shown that the precision required to measure CCAT optics using Coordinate Measuring

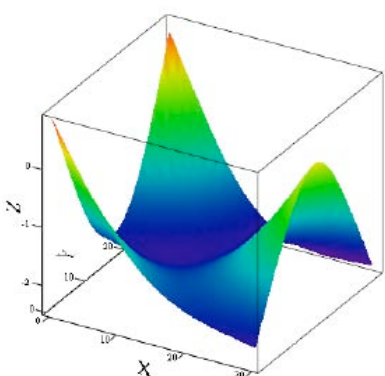
Machines is well within the state of current technology and affordable. The OWG will continue to pursue multiple options for panel fabrication technology including Al/Ni and borosilicate glass approaches. The objective is to qualify multiple approaches providing good competition in pursuit of the lowest price.

## Analysis of Mirror Panel Designs

Work continues at Cornell and Caltech to identify key issues in CCAT primary mirror panel design. Steve Parshley at Cornell has developed finite element



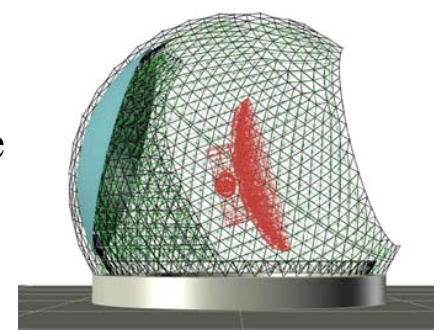
models to investigate options in panel design and effects on performance. David Woody of Caltech and Owens Valley Radio Observatory is working to optimize panel mounting for minimum deformation. These investigations address kinematic mounting of segments via flexures, addition of



stiffening ribs on the rear surfaces, effects of variations in design geometry and use of varying materials. The analysis will serve as the starting point for experimental validation in the next phase of CCAT development.

## MERO TSK Provides Dome Concept

MERO TSK of Wurzburg, Germany has developed a concept for the structure of the proposed CCAT Calotte style dome. Using their patented space frame



construction technology, their design weighs about 20% less than the previously developed concept while providing for precision assembly with no field welding and compact shipping via standard containers. They have previously provided concepts and cost estimates for steel and CFRP primary mirror trusses for CCAT and are expected to be strong competitors for CCAT procurements in these areas.