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A COSMOLOGY TELESCOPE AT THE SOUTH POLE AS A PRECURSOR TO OBSERVATORIES IN  
THE LUNAR POLAR REGION**Abstract**

BICEP is a telescope at the South Pole optimized to probe the polarization of the cosmic microwave background (CMB) for a signature of gravity waves from inflation at the beginning of the Big Bang. The instrument was developed by a team of  $\sim 15$  physicists and engineers from Caltech/JPL, UC Berkeley, and UC San Diego. With support from the United States Antarctic Program, it was installed in November 2005 in the Dark Sector Laboratory, 800 meters from the geographic South Pole. CMB observations were primarily conducted from February to November with one winter-over scientist at the South Pole Station for refilling cryogenics used to cool the bolometric detectors. The team deployed to the site during summer months for instrument modifications and calibration measurements. The unique location allowed us to map the cleanest available 2% of the sky under the best atmospheric condition on Earth at 100 and 150 GHz. We have completed 3 years of successful observations, mapping the CMB polarization anisotropy at degree angular scales with unprecedented sensitivity. Having coincided with the International Polar Year, we have participated in a live webcast with many schools to talk with them about astronomical observations from Antarctica. The success at a harsh remote site like the South Pole points to tremendous potential for astronomy at other ideal sites, including the lunar surface. In light of the recent selection by NASA of the Lunar University Node for Astrophysics Research, and ongoing private efforts like the International Lunar Observatory, this paper discusses how the experience at the South Pole of the Earth contributes to astronomy missions on the Moon.