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Landscape of Ground-Based CMB Polarization Measurements
JOHN CARLSTROM, The University of Chicago — After a review of the current state of ground-based CMB measurements, this talk will outline the ambitious plans of the community to greatly increase the sensitivity and science reach of the ground-based program with a next generation experiment, CMB-S4. Following the detection of CMB polarization by the DASI experiment located at the South Pole in 2002, the current generation of ground-based experiments each fielding of order 1000 superconducting detectors (Stage II experiments) have led to the first detection of the much fainter lensing B-mode polarization signal and the most stringent constraints on the level of the B-mode signal from inflationary gravitational waves. We can expect significant advances in the next few years as the ongoing ground-based experiments deploy of order 10,000 detectors (Stage III). The CMB community is now planning an ambitious next generation (Stage IV) ground-based program with order of 500,000 detectors, CMB-S4, to achieve critical threshold crossing goals of 1) detecting or ruling out large field inflationary models, 2) determining the effective number and masses of the neutrinos, and 3) providing precision constraints on dark energy through its impact on structure formation.

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