APR14-2014-000170

Abstract for an Invited Paper
for the APR14 Meeting of
the American Physical Society

CMB Lensing and the Hunt for Primordial B Modes

GILBERT HOLDER, McGill University

The polarization of the cosmic microwave background carries essential information about both the earliest moments of the universe (inflation) and the recent universe (gravitational lensing). Measurements of CMB polarization sourced by gravitational radiation from the inflationary epoch will provide a direct measurement of the energy scale of inflation, while measurements of the gravitational lensing signature provide direct measurements of the amplitude of large scale clustering in the universe, a sensitive probe of neutrino masses with a precision of $\sim$0.1 eV. Both of these probes particularly use the spatial variations of polarization that are classified as "B-modes," which have a characteristic curl pattern. Ongoing CMB experiments are now measuring the B-mode polarization signatures of gravitational lensing and searching for the B-mode signal from inflation. As a specific example, I'll talk about recent results from the South Pole Telescope, the first detection of B-mode CMB polarization from gravitational lensing.