

“Cosmology and Astrophysics Using the Oldest and the Most Distant Light”

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Observations of the cosmic microwave background (CMB) have played a critical role in establishing the standard six-parameter Λ CDM cosmological model. Beyond the primary CMB anisotropies, which carry a wealth of information about the primordial Universe, secondary anisotropies are powerful probes of the growth and evolution of structure. These arise from interactions between CMB photons and matter along the line of sight; the most prominent are gravitational lensing and the Sunyaev-Zeldovich (SZ) effects. In this talk, I will introduce the South Pole Telescope (SPT), a 10-metre telescope at the geographic South Pole, and current efforts to map the CMB with SPT-3G, its third-generation camera. I will then present recent and upcoming SPT-3G results, including cosmological constraints from both primary and secondary anisotropies. Finally, I will make the case for using secondary anisotropies to address long-standing questions in cosmology, including the physics of reionisation, the properties of dark energy and neutrinos, and the impact of baryonic feedback on structure formation, with SPT, the Simons Observatory, and future surveys.

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4:00 - 5:20PM**

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