

ASTROPHYSICS SEMINAR SERIES



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Tuesday, February 4 12:30 pm - Rm 184 NSH

Precision Cosmology with the Cosmic Microwave Background

The cosmic microwave background (CMB) provides unparalleled views into the early universe and its later evolution. Recent and ongoing experiments have contributed to our understanding of neutrinos, dark energy, and dark matter through measurements of large-scale structure imprinted on the CMB and constrained the conditions in the early universe, tightly restricting inflationary and other cosmological models through measurements of CMB polarization. Next-generation CMB experiments like Simons Observatory will further constrain the sum of the neutrino masses and the number of relativistic species, expand our understanding of dark energy and dark matter, and set new constraints on cosmological models describing the first moments of the universe. The polarization in the CMB is faint, so future experiments must be at least an order of magnitude more sensitive. These new levels of sensitivity necessitate improved systematic mitigation, which requires modeling and calibrating our instruments to unprecedented levels. I will discuss Simons Observatory and the advances in instrumentation and modeling that are critical for its leap in performance.



PHYSICS