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## Simons Observatory: status update and synergies with LSST

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The Simons Observatory (SO) is a new cosmic microwave background (CMB) experiment, located on Cerro Toco in Chile, that began observing in 2024. SO plans to measure the temperature and polarization variations in the CMB across six frequency bands, spanning 27 to 280 GHz. The initial setup includes three small-aperture (0.5-meter) telescopes (SATs) and one large-aperture (6-meter) telescope (LAT), using a total of 60,000 cryogenic bolometers. The detector count in both the SATs and LAT is planned to double by 2028.

The key scientific goals for SO include investigating primordial perturbations, determining the number and mass of relativistic species like neutrinos, testing the cosmological constant, improving insights into galaxy formation, and constraining the period of reionization. The SATs will observe the largest angular scales, covering about 10% of the sky with a white noise level of  $2 \mu\text{K-arcmin}$  in the combined 93 and 145 GHz bands, targeting the primordial tensor-to-scalar ratio,  $r$ , with a sensitivity goal of  $\sigma(r) = 0.003$  (in the nominal configuration). Meanwhile, the LAT will map roughly 40% of the sky at arcminute-scale resolution with an expected white noise level of  $6 \mu\text{K-arcmin}$  in the same bands, overlapping significantly with LSST's sky region and partially with DESI.

In this talk, we will outline the scientific objectives of SO, the current progress of the initial phase of data taking, and plans for future upgrades (SO:UK, SO:JP, and Advanced SO). We will also describe our work, which concerns some aspects of the data analysis pipeline such as map-making and instrumental modelization.

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