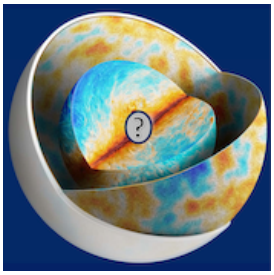

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Road to first light, an overview of Simons Observatory in 2024

lundi 4 décembre 2023 15:30 (25 minutes)

The Simons Observatory (SO) is a new cosmic microwave background experiment being built on Cerro Toco in Chile, due to begin observations in the early 2024. SO will measure the temperature and polarization anisotropies of the cosmic microwave background in six frequency bands, from 27 to 280 GHz. The initial configuration of SO will have three small-aperture 0.5-m telescopes (SATs) and one large-aperture 6-m telescope (LAT), with a total of 60,000 cryogenic bolometers. The detector count, both on SATs and LAT, will double in 2028.

Our key science goals are to characterize the primordial perturbations, measure the number of relativistic species and the mass of neutrinos, test for deviations from a cosmological constant, improve our understanding of galaxy evolution, and constrain the duration of reionization. The SATs will target the largest angular scales observable from Chile, mapping ~10% of the sky to a white noise level of 2 μK-arcmin in combined 93 and 145 GHz bands, to measure the primordial tensor-to-scalar ratio, r, at a target level of $\sigma(r)=0.003$. The LAT will map ~40% of the sky at arcminute angular resolution to an expected white noise level of 6 μK-arcmin in combined 93 and 145 GHz bands, overlapping with the majority of the LSST sky region and partially with DESI.

In this talk we will present the science goals of SO as well as the status of it deployment as we approach first light. We will also summarise the recently approved plans to upgrade the current design (SO:UK, SO:JP and Advanced SO).

Author: BERINGUE, Benjamin (APC, CNRS)

Orateur: BERINGUE, Benjamin (APC, CNRS)

Classification de Session: Experiments