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Cosmology and Clusters with the Atacama Large Aperture Submm Telescope (AtLAST)

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AtLAST will be a 50-meter-class telescope operating over the frequency range 30-950 GHz high in the Atacama Desert. The design goal is to achieve a field of view (FoV) 1-2 degrees in diameter. AtLAST will be the first telescope with an aperture larger than 10 meters to feature a FoV > 0.5 degrees, covering mm/submm wavelengths with good aperture efficiency up to 1 THz. It will be sited in the Atacama Desert in northern Chile at an elevation > 5000 meters above sea level and will deliver a throughput greater than that of CCAT-p/FYST, and with >8 times higher resolution. In the cosmological context, AtLAST will be able to probe the thermal, kinetic, and relativistic SZ effects on scales from $10''$ to 1 degree, measure the primary CMB at $\ell \sim 20000$, measure the multiple phases (i.e. the cold, warm, and hot) of the circumgalactic medium of galaxies, and provide resolved tomography of the dusty high- z universe to a confusion limit 2 orders of magnitude lower than any 6-10 meter class survey experiments planned or currently under construction. I will provide an overview of the project and science cases relevant to cosmology.

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