Abstract Submitted
for the SES21 Meeting of
The American Physical Society

Fundamental Physics, Cosmology, and Astrophysics with the Simons Observatory and CMB-S4 KEVIN HUFFENBERGER, Florida State University — The Cosmic Microwave Background (CMB), the afterglow of Big Bang, gives us a snapshot of the early universe. Because temperature and polarization fluctuations record so much information about cosmological parameters, the CMB has become a cornerstone of modern cosmology, and future observatories will provide a wealth of new data. Curl-type (or "B-mode") polarization is particularly interesting because it probes gravitational waves and the energy scale of inflation. However, polarized emission from the Milky Way is a serious contaminant to this signal. Meanwhile, large area, high-resolution surveys constrain the number of light relics permitted by beyond-the-standard-model scenarios. The same data give us a comprehensive view of the microwave sky. We can use the CMB as a backlight to learn about structure and astrophysical objects. For example, Sunyaev-Zeldovich scattering of CMB photons allows us to detect distant galaxy clusters, while gravitational lensing of the CMB by nearby structure is a powerful tool to probe the expansion history of the universe and even measure the mass of the neutrino. We see emission from supermassive black holes, dusty star-forming galaxies, and even flaring stars in our own stellar neighborhood.

Kevin Huffenberger
Florida State University

Date submitted: 30 Sep 2021 Electronic form version 1.4