



Contribution ID: 47

Type: **not specified**

(zoom) The Need for R&D Towards a Stage 5 CMB Facility

Thursday, 23 February 2023 16:10 (5 minutes)

CMB experiments have contributed powerful constraints on the fundamental physics of the Universe. Upcoming CMB experiments such as the Simons Observatory and CMB-S4 are poised to extend this progress even further. However, CMB experiments still have a wealth of information to offer beyond these near-term facilities regarding the properties of dark matter, inflation, light relic particles, and dark energy. In particular, a much lower-noise and higher-resolution wide-area CMB survey can cross a number of critical fundamental physics thresholds and open a relatively untapped window of late-time CMB anisotropies. The Snowmass Cosmic Frontier Report said we need to “Support R&D and pathfinder studies for a next-generation CMB experiment (at the Stage V or VI level)”, and “Support R&D and small projects to develop technologies and methods that can enable future surveys (e.g., LIM and CMB-S5)”. It is essential to support R&D this decade, on both the theory and instrumental fronts, to enable a future Stage 5 CMB facility and the wealth of discoveries it can provide.

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Session Classification: Open Session for Remarks and Discussions