

Impact of non-Gaussian Galactic foregrounds on measurements of CMB lensing and primordial gravitational waves

Monday 7 April 2025 15:50 (20 minutes)

A major challenge in the analysis of Cosmic Microwave Background (CMB) data is posed by the presence of Galactic foregrounds, especially thermal dust emission. Both the search for primordial B-modes and measurements of structure growth rely on foreground modelling, for which most works implicitly assume that all sky components follow Gaussian statistics. However, we know that this is a poor description for Galactic dust, which, for instance, exhibits non-Gaussian filamentary structure that cannot be reproduced from random Gaussian statistics. In this talk, I will begin by briefly discussing an in-depth study of whether dust non-Gaussianity can bias searches for primordial gravitational waves using CMB B-modes [1]. I will then focus on the impact it has on CMB lensing reconstruction analyses, with a particular focus on the final Atacama Cosmology Telescope CMB lensing power spectrum measurement.

[1] I. Abril-Cabezas, C. Hervías-Caimapo, S. von Hausegger, B. D. Sherwin and D. Alonso (2024) MNRAS, 527, 5751, arXiv: 2309.09978

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Session Classification: Contributed talks

Track Classification: UK Cosmo