

## **Galactic Science with the *LiteBIRD* satellite: Spectral characterization of diffuse Galactic polarized emission at the angular power spectrum level**

Accurate modeling of polarized Galactic emission has become a major challenge for current and next-generation Cosmic Microwave Background (CMB) *B*-mode experiments. Ignoring the spectral complexity of thermal dust and Galactic synchrotron emission when integrating along the line of sight and over large sky fractions inevitably leads to biases in CMB polarization analyses.

In this talk, I will review how the future *LiteBIRD* satellite, which will benefit from an increased number of bands and sensitivity with respect to past CMB experiments such as *Planck*, will exploit its broader frequency coverage to characterize the spectral properties of interstellar medium emission across the three-dimensional structure of the Milky Way. I will present a study of the polarized spectral energy distributions (SEDs) of diffuse Galactic emission and demonstrate the significant improvements *LiteBIRD* will achieve over *Planck*.

Nevertheless, the canonical description of foreground spectral behavior will reach its limits for *LiteBIRD*. I will show that this challenge can be addressed using moment expansion, in which modified black-body and power law SEDs are Taylor-expanded around the pivot spectral parameters,  $\beta$  and  $T$ . This enhanced modeling of the Galactic polarized signal enables unbiased measurements of the tensor-to-scalar ratio  $r$ , even in the presence of pessimistically complex foregrounds.