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Primordial Gravitational Wave Measurement with the LiteBIRD Space Mission

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LiteBIRD (Lite satellite for the study of B-mode polarization and Inflation from cosmic background Radiation Detection) is a JAXA-led space mission designed to probe the primordial universe by measuring the polarization of the cosmic microwave background (CMB) with unprecedented sensitivity. Scheduled for launch in the 2030s, LiteBIRD aims to detect the imprint of primordial gravitational waves through large-scale B-mode polarization, providing a powerful test of inflationary cosmology. The mission will carry out a full-sky survey over three years from the second Lagrange point (L2), with broad frequency coverage and high sensitivity—both essential for disentangling the cosmological signal from other polarized emissions.

In this talk, I will present LiteBIRD's scientific goals, observation strategy, instrument technology and design, as well as the challenges involved in extracting the tiny B-mode signal from the data. These include separating polarized Galactic emissions—primarily thermal dust and synchrotron radiation—and characterizing and mitigating instrumental systematics.

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