

LiteBIRD - A Satellite for Exploring the Universe before the Hot Big Bang with Measurements of Cosmic Microwave Background Polarization

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LiteBIRD is a satellite that will search for primordial gravitational waves emitted during the cosmic inflation era (around 10–38 sec after the beginning of the Universe). Its goal is to test representative inflationary models (single-field slow-roll models with large field variation) by performing an all-sky cosmic microwave background (CMB) polarization survey. Primordial gravitational waves are expected to be imprinted in the CMB polarization map as special patterns, called the “B-mode”. If we succeed to detect them, it will provide entirely new and profound knowledge on how our Universe began. From the viewpoint of high-energy physics or elementary particle physics, the observation of the CMB B-mode is also very important because it will allow us to search for physics in ultra high-energy scales, which are not accessible with man-made accelerators. Measurements of CMB polarization will open a new era of testing theoretical predictions of quantum gravity, including those by the superstring theory. In this presentation, I will present introduction and overview of the LiteBIRD satellites. I will give an introduction to including its scientific goals, instruments challenges and instruments that are under development.