



UNIVERSITÀ
DI TRENTO

Dipartimento di
Fisica



PhD Program in Space Science and Technology - SST

LiteBIRD: Probing Cosmic Inflation with Ultra-Sensitive Superconducting Detectors

Specific Seminar – Curriculum 5

July 14, 2026, 3 p.m.

Speaker:

Prof. Giovanni Signorelli - Department of Physics "E. Fermi" - University of Pisa

Abstract:

The Cosmic Microwave Background (CMB) offers a unique view of the Universe when it was only 380,000 years old and provides one of the most powerful probes of fundamental physics. LiteBIRD, a JAXA-led space mission with broad international participation, aims to measure the polarization of the CMB over the full sky with unprecedented sensitivity. Its primary objective is the search for primordial B-mode polarization, a possible signature of gravitational waves generated during cosmic inflation. This seminar will introduce the cosmological motivation for the mission, the physics encoded in CMB polarization, and the observational challenges involved in detecting such an extremely faint signal. The mission design and observing strategy will be discussed, together with the key role played by large arrays of superconducting Transition Edge Sensor (TES) bolometers, SQUID-based multiplexed readout systems, and cryogenic instrumentation. Particular attention will be given to how detector performance, systematic effects, and foreground removal impact the scientific reach of the mission. The seminar will conclude with an overview of the expected contributions of LiteBIRD to our understanding of inflation, the early Universe, and fundamental physics.

Online attendance:

Information on remote participation can be requested by sending an e-mail to dn_sst@unitn.it