Search for the imprint of inflationary gravitational waves in the CMB polarization with
a stratospheric balloon-borne polarimeter: the LSPE/SWIPE experiment.

Abstract:
One of the main forecasts of the inflationary cosmological paradigm is the presence of an isotropic background of gravitational waves traveling through the universe. While too strongly redshifted to be directly detectable today, their intrinsic quadrupolar nature affects the linear polarization state of the Cosmic Microwave Background photons at the epoch of decoupling, thus leaving an imprint in the angular pattern of CMB polarization, commonly referred to as primordial B-mode.

In this talk I will highlight the observational and technological challenges for the detection of this tiny signal, dominated by astrophysical polarized foregrounds and prone to instrumental systematics. I will also describe the main features of the LSPE/SWIPE polarimeter, an ASI/INFN-funded instrument scheduled for launch by the end of 2019. Its goal is to measure the large scale polarization of the microwave sky in 3 bands during a 15+ days night fly from the northern hemisphere, improving by an order of magnitude the current limits on the amplitude of the inflationary B-modes.