

Title: Theory and Observations of the Cosmic Microwave Background

Abstract

Modern observations of the Cosmic Microwave Background (CMB) anisotropies target the physics of the very Early Universe (EU) as well as the Dark Cosmological Components. The B-modes of CMB polarization are able to record and bring to observation the presence of Gravitational Waves (GWs) generated during Inflation. At the same time, the interaction of CMB photons with forming cosmological structures via Gravitational Lensing (GL) as well as the Integrated Sachs-Wolfe (ISW) effect is a carrier of information concerning the late time evolution of the Universe, and in particular the physical properties of Dark Matter and Energy. The proposers are active researchers in these areas, ranging from the analysis and exploitation of data to their theoretical interpretation. The CMB projects are presently ongoing and will be operative till at least the next decade. We propose to implement this line of research at the IFPU, exploiting the single location to gather all interested scientists in order to achieve coordination between various projects, growth of collaborations, production of original investigations, and maximizing the return from the results of ongoing observations.

Description

The research areas related to the exploitation of the modern CMB observations is multi-disciplinary and ranges from the science of data to the modelization, parametrization and constraint of the physics of the Early Universe and the Dark Cosmological Components. The IFPU offers an unique opportunity for scientists working at the different aspects to gather together in a single space, working on specific aspects, as well as overviewing the whole efforts, hosting dedicated meetings, scientific visits, and workshops. The team of proposers will host brainstormings and meetings on a weekly basis at the IFPU, spending at the institute 2 days per week, as well as organizing regular seminars at the site. Moreover, the team will create and propose a living program of visits, dedicated and focussed meetings, and workshops throughout the academic year. We plan to make a gross planning of activities at the beginning of each academic year, but to refine the program on a monthly or weekly basis. The activities will be constantly mirrored on the IFPU site and will be set in coordination with members from the four founding institutions.

PIs: Carlo Baccigalupi, Nicoletta Krachmalnicoff, Davide Poletti

Members

Mirko Boezio (INFN)
Paolo Campeti (PhD student, SISSA)
Paolo Creminelli (ICTP)
Farida Farsian (PhD student, SISSA)
Hasti
Anto Lonappan (PhD student, SISSA)
Anirban Roy (PhD student, SISSA)
Andrea Zacchei (INAF)

...