Cosmic Microwave Background & Large Scale Structure Cross-Correlation

Specific Seminar – Curriculum 1

May 3, 2023, 4 p.m.

Speaker:

Prof. Marina Migliaccio, Department of Physics, Tor Vergata University of Rome

Abstract:

In the coming years, we expect a wealth of new data to be collected from deep and wide galaxy surveys, which will complement the high sensitivity maps of the Cosmic Microwave Background (CMB) delivered by Planck and other ground-based experiments. The information gathered by these surveys will cover a wider range of physical scales and different cosmic epochs, making it crucial and timely to investigate the interactions and complementarities of these diverse probes of the Universe. One promising approach is to study the cross-correlations between different observables that are sensitive to the same physics. This allows to maximize the scientific outcome of each probe while mitigating the impact of poorly known instrumental and astrophysical systematics that may affect each probe separately. CMB photons have travelled across the entire visible Universe and, as a result, they have witnessed the formation of the Large Scale Structure (LSS) and the onset of the Universe's accelerated expansion phase. These events left unique imprints on the CMB anisotropy pattern, induced by the interaction with the gravitational potential wells. Specifically, distinctive anisotropies were generated due to gravitational lensing and gravitational redshift (known as Integrated Sachs-Wolfe effect, or ISW). In this context, we will discuss how measuring the cross-correlation of the CMB lensing and ISW with the distribution of galaxies can help constrain galaxy bias models, improve the accuracy of cosmological parameters estimates, and test the dark energy scenario. We will present recent results based on current data, as well as preparatory work for the upcoming European Space Agency mission Euclid.

Online attendance: https://rebrand.ly/Seminar-Migliaccio (via MS Teams App or Browser)

Prof. Carlo Baccigalupi
Scuola Internazionale Superiore di Studi Avanzati (SISSA)Trieste
carlo.baccigalupi@sissa.it

National PhD in Space Science and Technology - Secretariat
+39 0461 281504
dn_sst@unitn.it