DIPARTIMENTO DI SCIENZE MATEMATICHE E INFORMATICHE, SCIENZE FISICHE E SCIENZE DELLA TERRA
Dottorato di Ricerca in Fisica

Appunti di Fisica '22

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su Microsoft Teams "Seminari di Appunti di Fisica"

Dealing with the inhomogeneous Universe: The Cosmographic Approach in Relativistic Cosmology

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Cosmology is concerned with the study of the large-scale structure of the observable region of the Universe. This investigation faces a fundamental limitation: there is only one Universe. We can just observe it, moreover only from a single spacetime event: the dynamics of the Universe is not repeatable and subject to the statistical sampling typical of the scientific method. In this scenario, we need to be extra careful with the scientific approach we adopt to interpret the cosmological implications of astrophysical observations.

In this introductory talk, we will discuss the successes and limitations of the standard approach to Cosmology, introducing an alternative way to proceed: the direct observational approach. It aims at constructing a theoretical model for the dynamics of the Cosmos relying only on the information available through observations (Cosmography), without assuming, as far as possible, an a priori model.

Adopting this cosmographic approach, we focus our discussion on the role that inhomogeneities may have in constructing a cosmological model of the Universe that accounts for Dark Energy.