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AULA BENEDETTO DE TOLLIS

Reconstructing the Universe from Type Ia Supernovae

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Cosmology is the study of the origin, components, evolution, and final fate of the Universe. In recent decades, there have been significant advances in both observational and theoretical aspects of our understanding of the Universe, leading to the formulation of the Standard Cosmological Model, also known as Λ CDM. The study of Type Ia Supernovae (SNe Ia) has been instrumental in the development of this model. In particular, the observation of high-redshift SNe Ia led to the discovery of the accelerated expansion of the Universe in 1998. Despite our advances in the field, many questions in cosmology are still open. This thesis shows that the future of supernova cosmology remains promising. In particular, we emphasize the importance of continuing to study the SNe Ia in order to reconstruct both the local and the primordial Universe.