UNIVERSITÀ DEGLI STUDI DI PADOVA

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Seminar

STATISTICAL CHALLENGES IN SUPERNOVA TYPE IA COSMOLOGY

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STATISTICAL CHALLENGES IN SUPERNOVA TYPE IA COSMOLOGY

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Thanks to large and accurate measurements obtained in the last 2 decades, and to sophisticated statistical analyses, cosmologists have established a "cosmological concordance model" that reproduces well observations ranging from the relic radiation from the Big Bang to the distribution of galaxies in the sky in the modern Universe. I will review the observational and theoretical underpinnings of this so-called "Lambda-CDM" concordance model of cosmology, which strongly points to the existence of both dark matter and dark energy.

I will then focus on recent advances in supernova type Ia cosmology.
Supernovae type Ia are a type of stellar explosion that can be used as standard candles to measure extragalactic distances, and have been instrumental in determining the accelerated expansion of the Universe -- a smoking gun observation for the existence of dark energy. I will present recent results and a novel, powerful Bayesian statistical framework for interpreting the data. I will discuss present and upcoming statistical challenges for the field as the quantity and quality of upcoming data sets increases.