

Unraveling the Universe with spectroscopic surveys: Final results of eBOSS, present and future with DESI

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One of the most important open questions in cosmology today is the understanding of the accelerated expansion of the Universe. Spectroscopic surveys provided a unique opportunity to explore the expansion history of the Universe as well as to measure the growth of structure through the analysis of the large-scale structure in the Universe. Cosmic Acceleration can be explained by either modifying General Relativity on cosmological scales, or within the framework of the standard cosmological model introducing an unknown new component called "dark energy". During the last 2 decades, SDSS have been operating a succession of spectroscopic surveys: SDSS, BOSS and eBOSS, all of them driven by the same science goal of decrypting the mysterious cosmic expansion. Just after eBOSS finishes its program, the next generation stage IV ground-based dark energy experiment, Dark Energy Spectroscopic Instrument (DESI) will start their science operations for 5 years. DESI will revolutionize dark energy constraints improving the precision by at least one order of magnitude current stage III experiments.

In this talk I will present the final analysis of eBOSS and their cosmological results released this summer that represents a culmination of 20 years of clustering analysis with spectroscopic surveys in SDSS. I will also review the DESI dark energy experiment that had turn of the first light in Fall 2019, carry on their commissioning program and started the survey validation programs this year, both programs preceding the science survey programmed to start next year 2021. I will review DESI instrument, the current status and a summary of the forecast for the key observables of the survey (BAO and RSD).

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