NEW YORK CITY COLLEGE OF TECHNOLOGY
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From Galaxies to Cosmic Acceleration

Presented by:

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Abstract

The remarkable observation of cosmic acceleration can be explained in terms of either Dark Energy filling space, or General Relativity (GR) failing on cosmological scales. These classes of theories lead to different predictions for the expansion history of the Universe and the growth of large-scale structure. Therefore, experiments that are sensitive to both these quantities, such as galaxy surveys, can be used to discriminate between them. I will describe my work in formulating model-independent tests of the GR+LCDM concordance model of cosmology, and show the expected results from the Hobby Eberly Telescope Dark Energy eXperiment (HETDEX).

However, in order to validate the constraints on the behavior of Dark Energy and gravity, one needs a precise understanding of the physical properties of target galaxies, as well as the ability of efficiently analyzing vast amounts of data. For this purpose, I have built a publicly available Markov Chain Monte Carlo algorithm for Spectral Energy Distribution fitting. I will briefly describe the algorithm, as well as its current applications to data from large galaxy surveys, which offer many possibilities to involve undergraduate students in publishable research.