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**From the Inflationary Universe to Black Holes to Dark Energy using the Hobby-Eberly Telescope
Dark Energy Experiment**

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Observations over the next decade will examine the expansion history of the universe, given that we have little understanding for what drives the expansion either at late times (i.e., the nature of dark energy) or early times (i.e., inflation). I will describe an observational approach based on a large redshift survey called the Hobby-Eberly Telescope Dark Energy Experiment (HETDEX). Our goal is to understand the universe expansion, and also we will exploit the unique opportunity to study black holes and dark matter profiles in galaxies. The latest results for both the dark matter profiles and black holes show important trends that impact theories of galaxy formation and black hole growth. Thus, the inflationary universe has much to offer.