Abstract Submitted
for the APR10 Meeting of
The American Physical Society

Probing the Dark Matter-Galaxy Formation Connection with Lyman Alpha Emitting Galaxies[1] ERIC GAWISER, Rutgers University, MUSYC COLLABORATION — I will describe how our understanding of cosmological structure formation is used to probe the dark matter properties of high-redshift galaxies and to identify their present-day descendants. Samples of 261 and 162 Lyman Alpha Emitting (LAE) galaxies at redshifts $z = 2.1$ and $z = 3.1$, respectively, were discovered in deep narrow-band imaging of the MUSYC survey. The LAEs exhibit a moderate clustering bias of $b = 1.8 + -0.3$, which implies median dark matter halo masses of 10^{11} $M_{\odot}$. The evolution of dark matter halo mass with redshift predicts that these LAEs evolve into typical present-day galaxies like the Milky Way, whereas other high-redshift galaxy populations, including Lyman Break Galaxies and Active Galactic Nuclei, typically evolve into more massive galaxies. Hence these Lyman Alpha Emitting galaxies represent our first direct knowledge of the progenitors of galaxies like the Milky Way seen when the universe was only 2-3 Gyr in age. I will also describe how these galaxies will be used by HETDEX and LSST to probe cosmological parameters including the dark energy equation-of-state and neutrino masses.
References: Gawiser et al. 2007 (Astrophysical Journal 671, 278), Guaita et al. 2009 (ArXiv:0910.2244)

[1]We gratefully acknowledge research grants from NSF, DOE, and NASA.

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Date submitted: 23 Oct 2009 Electronic form version 1.4