University of Texas at San Antonio

Department of Physics & Astronomy

# Dr. Rosalba Perna

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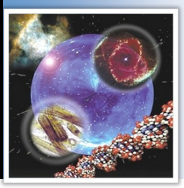
**Friday, October 26, 2012**

**Time: 3:00 p.m.- 4:00 p.m.**

**BB 3.04.18**

## Gamma-Ray Bursts as Tools for Extragalactic Astrophysics and Cosmology

Gamma-Ray Bursts (GRBs) are the brightest light sources in the Universe, as well as the most distant sources known. These characteristics, combined with their powerlaw spectra, make them ideal cosmological probes. In this talk I will discuss how GRBs are impacting several areas of extragalactic astrophysics and cosmology. In particular, I will show how they can be used to trace the evolution of the mean density and clumpiness of the interstellar medium with redshift, and the properties of dust in high-z galaxies. Detection of GRBs at very high redshifts can help set constraints on the small-scale power spectrum of density fluctuations. High-resolution observations of long GRBs allow to shed light on the properties of their massive star progenitors. Statistical studies of short GRBs can improve our understanding of evolutionary binary scenarios.



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