GENERAL SEMINAR

"Physics of Type Ia Supernovae and Cosmology"

Dr. Peter Hoeflich

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Thursday, September 23, 2004, 3:40 PM in Room 109 Nicholson Hall

Host: Dr. Brad Schaefer

(Refreshments served at 3:15p.m. in Room 229 Nicholson)

ABSTRACT

The last decade has witnessed an explosive growth of high-quality data for supernovae. Advances in computational methods provided new insights into the physics of the objects. Both trends combined provided spectacular results not only for astronomy but also for high energy and particle physics. Type Ia supernovae (SNe Ia) turned out to be excellent distance indicators due to their brightness and apparent homogeneity, and we start to understand why this is the case. SNe Ia observations have allowed good estimates of the Hubble constant, and provided strong evidence of the need for a Cosmological Constant. The quest for the nature of the dark energy requires even higher accuracy cosmology and supernovae at even larger red-shifts. Among others, possible candidates are the cosmological constant, vacuum energy, or gravitational waves. For the most distance supernovae, we are looking back in time by about 10,000,000,000 yrs which makes the systematic and evolutionary effects in the SNe Ia population a major source of concern. A better understanding of SNe Ia is required to advance these fields. In the talk, I want to give an overview of the current status and the upcoming challenges.

PUBLICATIONS


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