



THE UNIVERSITY OF
CHICAGO

Department of Statistics
STATISTICS COLLOQUIUM

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**Probing Cosmic Acceleration with the Dark Energy
Survey: Statistical Challenges and Big Data in
Cosmology**

MONDAY, March 10, 2014, at 4:00 PM

133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110

ABSTRACT

The Nobel Prize in Physics for 2011 was awarded for the discovery that the expansion of the Universe is accelerating. Yet the physical origin of cosmic acceleration remains a mystery. The Dark Energy Survey (DES) aims to address the questions: why is the expansion speeding up? Is cosmic acceleration due to dark energy or does it require a modification of Einstein's General Relativity? DES is addressing these questions by carrying out a cosmological survey of 200 million galaxies over 1/8th of the sky using a new, 570-megapixel, digital camera on a 4-meter telescope in Chile over the next several years. I will overview the DES project, which achieved 'first light' in September 2012 and which just finished its first survey season last month, and present some early results. In the process, I will discuss some of the "Big Data" challenges in processing and analyzing the data and highlight a number of the statistical methods being employed to extract useful cosmological information (machine learning, spatial N -point clustering statistics, cluster-finding algorithms, Bayesian classification, MCMC, etc).

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