The University of Chicago
Department of Statistics

STATISTICS COLLOQUIUM

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Sharp Thresholds in Statistical Learning

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133 Eckhart Hall, 5734 S. University Avenue
Refreshments following the seminar in Eckhart 110.

ABSTRACT

Sharp thresholds are ubiquitous high-dimensional combinatorial structures. The oldest example is probably the sudden emergence of the giant component in random graphs, first discovered by Erdos and Renyi.

More recently, threshold phenomena have started to play an important role in some statistical learning and statistical signal processing problems, in part because of the interest in 'compressed sensing'. The basic setting is one in which a large number of noisy observations of a high-dimensional object are made. As the ratio of the number of observations to the number of 'hidden dimensions' crosses a threshold, our ability to reconstruct the object increases dramatically. I will discuss several examples of this phenomenon, and some algorithmic and mathematical ideas that allow to characterize these threshold phenomena.

[Based on joint work with Mohsen Bayati, David Donoho, Iain Johnstone, Arian Maleki.]