

Special Colloquium

Random graphs, Optimization, and Spin glasses

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Abstract: Combinatorial optimization problems are ubiquitous in diverse mathematical applications. The desire to understand their "typical" behavior motivates a study of these problems on random instances. In spite of a long and rich history, many natural questions in this domain are still intractable to rigorous mathematical analysis. Graph cut problems such as Max-Cut and Min-bisection are canonical examples in this class. On the other hand, physicists study these questions using the non-rigorous "replica" and "cavity" methods, and predict complex, intriguing features. In this talk, I will describe some recent progress in our understanding of their typical properties on random graphs, obtained via connections to the theory of mean-field spin glasses. The new techniques are broadly applicable, and lead to novel algorithmic and statistical consequences.

Colloquium tea to follow at 4pm in SEO 300.

Friday, February 15 at 3:00 PM in 636 SEO