

Colloquium

University of Notre Dame
Department of Mathematics

William Perkins - University of Birmingham

Speaker: William Perkins

University of Birmingham



Will give a lecture entitled

Information Theoretic Thresholds from the Cavity Method

Date: Monday, January 23, 2017

Time: 4:00 PM

Location: 129 Hayes-Healy Hall

Departmental Tea: Tea in Room 257 (lounge in Hurley Hall) at 3:30 p.m.

Abstract:

The stochastic block model is a simple benchmark model for the statistical and computational problem of graph clustering: partitioning a graph of vertices and edges into clusters of “similar” vertices. In the model we take a large set of nodes, divide them into q equal clusters, then add edges at random with probabilities that depend on whether the two nodes joined belong to the same cluster or not. The computational problem is to determine the original clusters given just the graph structure. I will present a result that determines the threshold edge density at which the problem of detecting the clusters becomes information theoretically possible in the disassortative stochastic block model. The proof vindicates the intricate but non-rigorous “Cavity Method” from statistical physics. Based on joint work with A. Coja-Oghlan, F. Krzakala, L. Zdeborova.