



# THE UNIVERSITY OF CHICAGO

Departments of Computer Science, Mathematics, Statistics and the Computation Institute  
**SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR**

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## Statistical Physics of Constrained Large Dense Networks

THURSDAY, January 19, 2017 at 4:30 PM  
226 Jones Laboratory, 5747 S. Ellis Avenue  
Host: Lek-Heng Lim

### ABSTRACT

We study the asymptotics of large random graphs constrained by the limiting density of edges and the limiting subgraph density of an fixed graph  $H$  (for instance two stars and triangles etc). We show numerically and analytically (in some cases) that typical graphs with such constraints have very simple structures: asymptotically in the number of vertices there is a partition of the vertices into  $M < \infty$  subsets  $V_1, V_2, \dots, V_M$ , and a set of well-defined probabilities  $g_{ij}$  of an edge between any  $v_i \in V_i$  and  $v_j \in V_j$ . We discuss briefly some possible applications of this research, for instance in image processing.

This talk is based on joint works with Richard Kenyon (Brown), Charles Radin (Austin) and Lorenzo Sadun (Austin).

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#### Organizers:

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