

Seminar on Combinatorial Computing
November 7, Wednesday, 6:30 p.m.
Room 6417, Graduate Center
365 Fifth Avenue, New York

The Erdős-Rényi phase transition

Joel Spencer
Courant Institute, NYU

Abstract

In their great 1960 paper *On the Evolution of Random Graphs* Paul Erdős and Alfred Rényi expresses a special interest in the behavior of the random graph $G(n, p)$ when p was near n^{-1} . Today we view it through the prism of Percolation Theory. If $p = cn^{-1}$ and $c < 1$ the process is subcritical and all components are small and simple. But for $c > 1$ the process is supercritical and a complex giant component has emerged. We now understand the fine structure: the critical window is parametrized $p = n^{-1} + \lambda n^{-4/3}$, with $\lambda \rightarrow -\infty$ and $\lambda \rightarrow +\infty$ representing the barely subcritical and barely supercritical phases. We discuss the behaviors, the arguments and the many analogies to bond percolation in Mathematical Physics.

For further information contact János Pach at pach@cims.nyu.edu,
or visit our website
http://www.math.nyu.edu/~pach/public_html/combinatorics_seminar.html