Seminar on Combinatorial Computing
September 27, Wednesday, 6:30 p.m.
Room 6417, Graduate Center
365 Fifth Avenue, New York

Induced subgraphs of Ramsey graphs with many distinct degrees

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Abstract

An induced subgraph is called *homogeneous* if it is either a clique or an independent set. Let hom(G) denote the size of the largest homogeneous subgraph of a graph G. The classic result in Ramsey theory asserts that $\mathrm{hom(G)} \geq \frac{1}{2} \log \mathrm{n}$ for any graph G on n vertices, and it is best possible apart from the value of the multiplicative constant. We study properties of graphs on n vertices with $\mathrm{hom(G)} \leq \mathrm{C} \log \mathrm{n}$ for some constant C. We show that every such graph contains an induced subgraph of order αn in which $\beta\sqrt{n}$ vertices have different degrees, where α and β depend only on C. This proves a conjecture of Erdős, Faudree and Sós.

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http://www.math.nyu.edu/p̃ach/public_html/combinatorics_seminar.html