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* **UCLA Combinatorics Seminar** *

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Date: Thursday, April 3, 1.50-2.50 in Room 6943

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The Effect of Induced Subgraphs on Quasi-Randomness

Abstract

One of the main questions that arise when studying random and quasi-random structures is which properties P are such that any object that satisfies P "behaves" like a truly random one. In the context of graphs, Chung, Graham and Wilson call a graph p-quasi-random if it satisfies a long list of properties that hold in $G(n,p)$ with high probability, like edge distribution, spectral gap, cut size, and more.

Our main result here is that the following holds for *any* fixed graph H: if a graph G has the property that the distribution of induced copies of H in a graph G is close (in a well defined way) to the distribution we would expect to have in $G(n,p)$, then G is either p-quasi-random or q-quasi-random, for some $q = q(p,H)$. In other words, having the correct distribution of induced copies of any single graph H, is enough to guarantee that a graph has all the properties of a random one.

Joint work with Raphy Yuster