
* UCLA Combinatorics Seminar *

Date: Thursday, January 29, 1.50-2.50 in MS 7608

Graeme Kemkes

UCSD

On the chromatic number of a random d -regular graph

Abstract

We determine the chromatic number of a random d -regular graph for about half of all values of d . Letting k be the smallest integer satisfying $d < 2(k - 1) \log(k - 1)$, we show that a random d -regular graph is k -colorable asymptotically almost surely (a.a.s.). Together with previous results of Molloy and Reed, this establishes the chromatic number as a.a.s. $k - 1$ or k . If furthermore $d > (2k - 3) \log(k - 1)$ then the chromatic number is a.a.s. k . This is an improvement upon results recently announced by Achlioptas and Moore.

The method used is “small subgraph conditioning” of Robinson and Wormald, applied to count colorings where all classes have the same size. This is the first rigorously proved result about the chromatic number of random graphs that was proved by small subgraph conditioning.

This is joint work with Xavier Pérez-Giménez and Nick Wormald.