慶應義塾大学 21世紀COEプログラム
「統合数理科学：現象解明を通した数学の発展」

Integrative Mathematical Sciences 統合数理科学

Keio University

Pathways Lecture Series in Mathematics, KEIO

Speaker : Prof. Jeong Han Kim
(Yonsei University)

Place : Room 14-203, 2nd Floor, Bldg.14
Faculty of Science and Technology
Yagami Campus, KEIO University

Lecture 1 14:00 - 15:00 October 25, 2007 (Thursday)

Title : *Random Graphs, Random Regular Graphs and Couplings*

The study of random regular graphs, started in late 70's, has recently attracted much attention. Main questions in this area have been whether the random regular graph contains a perfect matching, a Hamilton cycle, and a Hamilton decomposition. These properties are closely related to the contiguity of random models. Roughly speaking, two models are contiguous if they are essentially the same. For example, one may consider the uniform random 3-regular graph and the union of three independent random perfect matchings, and ask whether the two models are essentially the same or not. We will discuss contiguity of various random regular graph models.

We will also introduce some attempts to study random (hyper)graphs by means of random regular (hyper)graphs. In particular, we will discuss recent improved bounds for Shamir's problem regarding when the random uniform hypergraph contains a perfect matching.

Lecture 2 15:15 - 16:15 October 25, 2007 (Thursday)

Title : *The Ramsey number R(3,t) has asymptotic order of magnitude $t^2 / \log t$*

The Ramsey number R(s,t) is the minimum integer n for which every red-blue coloring of the edges of a complete n-vertex graph induces either a red complete graph of order s or a blue complete graph of order t. In this talk, we describe a dynamic probabilistic method which is used to settling an old problem on R(3,t). Namely, R(3,t) has asymptotic order of magnitude $t^2 / \log t$.

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