# APPLIED MATHEMATICS COLLOQUIUM

## RANDOM POPULAR MATCHINGS

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**ABSTRACT:**

We consider matching markets where a centralized authority must find a matching between the agents on one side of the market, and the items on the other side. Such settings occur, for example, in mail-based DVD rental services such as NetFlix or in certain job markets. A popular matching is defined as a matching that is preferred by a majority of the agents to any other matching. The main drawback of this solution concept is that popular matchings sometimes do not exist. We partially address this issue by proving that in a probabilistic setting where preference lists are drawn at random and the number of items is more than the number of agents by a small multiplicative factor, popular matchings almost surely exist. More precisely, we prove that there is a threshold ($\sim =1.42$) such that as the number of items divided by the number of agents passes this threshold, the probability of existence of a popular matching goes from zero to one asymptotically. Our proof uses a characterization result by Abraham et al., and a number of tools from the theory of random graphs.

**MONDAY, NOVEMBER 28, 2005**
**4:30 PM**
**Building 2, Room 105**

*Reception at 4:00 PM in Building 4, Room 174.*
*(Math Majors Lounge)*