Geometry Seminar
March 28, 2006, Tuesday, 6:00 p.m.
Room 613, Courant Institute
251 Mercer Street, New York

Making or avoiding a planar graph

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Abstract

The Planarity Game is played by two players, who alternately occupy the edges of the complete graph until no edge is left. In the Maker/Breaker-version the player named Maker wins the game if he occupied a nonplanar graph, otherwise Breaker wins. In the Avoider/Enforcer-version the player named Avoider wins if at the end of the game his graph is planar, i.e. if he *avoided* occupying a nonplanar graph, otherwise the player named Enforcer wins.

It turns out that these unbiased versions of the Planarity Game are won easily by Maker and Enforcer, respectively. One could help the other players by requiring Breaker, and Enforcer, respectively, take $b > 1$ edges in one round. This biased version of the game is studied and the critical bias b is sought where Maker's win turns into a Breaker's win, or an Enforcer's win into an Avoider's win, respectively.

This problem is part of the general framework of *positional games.* In the talk we also survey our current knowledge about Maker/Breaker- and Avoider/Enforcer-type positional games, discuss their relations to each other and to the theory of random graphs. Based on joint works with Dan Hefetz, Michael Krivelevich and Milos Stojakovic.

For further information contact {pach,pollack}@cims.nyu.edu, or visit our website: http://www.math.nyu.edu/seminars/geometry_seminar.html