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* **UCLA Combinatorics Seminar** *

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Date: Thursday, February 5, 1.50-2.50 in MS 7608

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Playing to retain the advantage

Abstract

In 1998 Duffus, Luczak and Rodl posed the following question:

Is there an integer K such that for all graphs G with chromatic number at least K, Maker has a strategy to choose an odd cycle in the game, where Maker chooses one edge and Breaker two, in each round?

(Actually, the DLR question was about the vertex claiming version of the game, but the edge claiming version stated above is somewhat more natural and at least equally interesting.)

The above problem is one (yet quite challenging!) example of a general setting of a two player biased game. The game is between Maker and Breaker, who take turns in claiming unoccupied edges of a graph G, the board of the game; Maker takes one edge at a time, while Breaker claims $b \geq 1$ edges. The graph G is assumed to be far from a monotone property $\mathcal{P}$, in some well defined quantitative sense, and Maker wins iff by the end of the game his edges form a graph M that does not possess $\mathcal{P}$.

In this talk I will discuss several problems and results of this sort. The aim of the talk is two-fold: to popularize the DLR problem and its relatives, and also to acquaint the audience with the circle of ideas and techniques surrounding this subject.

Joint work with Noga Alon (Tel Aviv) and Dan Hefetz (ETH Zurich).