



Invited Speaker



Dr. Nick Loehr

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“Rook Theory 101”

Monday, September 28, 2015 • Smith Hall 621 • 4:00pm

Abstract

Combinatorics is the mathematical theory of counting. In this talk, we introduce combinatorics through the subject of rook theory — which has nothing to do with chess! The first goal of rook theory is to count configurations of rooks on generalized chessboards so that no two rooks attack each other. The k 'th rook number of a board counts the number of such ways to place k rooks on the board. It often happens that two different boards share the same rook numbers. This talk investigates when and why this occurs by using geometric and algebraic manipulations of boards and rook placements. We present theorems of Foata/Schutzenberger and Goldman/Joichi/White characterizing rook-equivalent boards in various ways. The techniques used illustrate three branches of modern combinatorics — enumerative combinatorics, bijective combinatorics, and algebraic combinatorics. No prior knowledge of counting (or chess) is required for this talk.