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Geometry and the Chess Pieces

Abstract for the Combinatorics Seminar 2014 March 11

Seth Chaiken, Chris Hanusa, and I have developed a theory of how to count nonattacking placements of q identical copies of certain chess pieces—the ones whose moves have no length limit, like the bishop, queen, nightrider, and one-armed queen—on an n × n chessboard. The counting function as a function of n is a quasipolynomial with coefficients that are polynomials in q (divided by q!). The method combines high-dimensional hyperplane arrangements, lattice points in convex polytopes, and brute force counting. I will explain how this works and why it's good even though it's hard to get complete answers this way.
