

MATHEMATICS DEPARTMENT  
North Carolina State University

ALGEBRA SEMINAR

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A combinatorial proof of Macdonald positivity  
using dual equivalence graphs

**ABSTRACT:** Macdonald polynomials have been widely studied since they were introduced by Macdonald in 1988. Originally defined as the unique functions satisfying certain triangularity and orthogonality conditions, they are known to be symmetric and so may be expanded in terms of Schur functions. The Macdonald Positivity Conjecture (now Theorem) states the expansion into Schur functions has non-negative integer coefficients. The original proof, due to Haiman in 2001 based on joint work with Garsia, uses difficult machinery in algebraic geometry and offers no combinatorial understanding for the coefficients. In this talk we present a purely combinatorial proof of Macdonald positivity using Haglund's monomial expansion for Macdonald polynomials and the newly developed theory of dual equivalence graphs, and we give a combinatorial interpretation for the Schur coefficients.

3:00 - 3:50 pm    HA 335

Faculty and Students are invited to attend.