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Wreath Macdonald Polynomials - Operators and Identities

Wreath Macdonald polynomials are multisymmetric functions generalizing modified Macdonald polynomials. Whereas modified Macdonald polynomials correspond to representations of the symmetric group S_n and torus fixed points on the Hilbert scheme of points on the plane, the wreath version corresponds to $S_n \wr \mathbb{Z}/r\mathbb{Z}$ representations and $\mathbb{Z}/r\mathbb{Z}$ fixed loci in the Hilbert scheme. The existence, integrality, and positivity of wreath Macdonald polynomials was conjectured by Haiman in 2002. In 2014, these conjectures were proved by Bezrukavnikov and Finkelberg using algebraic geometric methods.

This talk is based on joint work with Josh J. Wen, where we develop computational tools for dealing with wreath Macdonald polynomials. In particular, we will focus on describing their Pieri rules and describe how we prove this by giving wreath analogues of Tesler's Identity, nabla and Delta operators, and Garsia-Mellit's Five Term Relation.