



Special Colloquium



A tour of symmetric functions and
tableau combinatorics

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Abstract: The Schur function basis of the ring of symmetric functions is a central object in algebraic combinatorics, in part due to their deep connection to representation theory of the general linear group and to the cohomology ring of the Grassmannian. Their ties to representation theory make Schur positivity of symmetric functions a sought-after property. After introducing symmetric functions and the Schur basis, I will present a result that gives the probability that a symmetric function is Schur positive. Next, I present analogues of the Schur functions called stable Grothendieck polynomials, which play the role of Schur functions in the K-theory ring of the Grassmannian. I end by discussing several of my results with various coauthors that aim to understand the combinatorics associated to this ring via the stable Grothendieck polynomials and their analogues.

Keywords: algebraic combinatorics, Schur functions,
Grothendieck polynomials, cohomology rings

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