Hook formulas for skew shapes

Greta Panova
(University of Southern California)

Abstract

In 2014, Naruse announced a formula for skew shapes as a positive sum of products of hook-lengths using "excited diagrams" coming from the Algebraic Geometry of the Grassmannian. We will show several combinatorial and algebraic proofs of this formula. Multivariate versions of the hook formula lead to exact product formulas for certain skew SYTs and evaluations of Schubert polynomials. The Naruse hook-length formula can also be used to derive asymptotic results for the $f^{\lambda/\mu}$'s in many regimes, and principal evaluations of certain Schubert polynomials shedding light over Stanley's "Schubert shenanigans" conjectures. Joint work with Alejandro Morales and Igor Pak.