

BI-CO MATHEMATICS COLLOQUIUM

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“On Decomposition of the Product of Demazure Atom and Demazure Characters”

Monday, October 24, 2016

Talk at 4:00 – Park 338

Tea at 3:30 – Park 355, Math Lounge

Abstract:

It is an open problem to prove the Schubert positivity property combinatorially. Recently Haglund, Mason, Remmel, van Willigenburg et al. have studied the skyline fillings (a tableau-combinatorial object giving a combinatorial description to nonsymmetric MacDonal polynomials), proved by Haglund, Haiman and Loehr) specifically for the case of Demazure atoms (atoms) and key polynomials (keys). This suggests a new approach to a combinatorial proof of Schubert positivity property. In this talk, I will introduce Demazure atoms and key polynomials using skyline fillings called semi-standard augmented fillings (SSAFs) and define generalized Demazure atoms by some modifications on SSAF defining atoms and keys. I will illustrate the insertion algorithm on Demazure atoms proved by Mason and describe refinements of Littlewood-Richardson rule proved by Haglund, Mason and Willigenburg. Then I will describe an algorithm to prove the atom positivity property of the product of a monomial and a Demazure atom. The last result gives a positive support to the approach of the combinatorial proof of Schubert positivity property. If time allows, I will show some connection with polytopes and discuss some conjectures.

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