Combinatorial Aspects of the Cohomology and K-theory of Flag Varieties

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(Tea 3:30 pm Math Lounge)

Abstract

In this talk we present some recent results related to Schubert and Grothendieck polynomials. These polynomials represent Schubert classes, which form the natural bases of the cohomology and K-theory of the complex flag variety. We present background information on several combinatorial constructions of Schubert and Grothendieck polynomials. Then we present the solution to a conjecture concerning the relationship between these polynomials, and some results related to the main open problem in the theory of Schubert polynomials, which is the Littlewood-Richardson rule. The latter concerns a combinatorial description of the structure constants of the ring of polynomials in infinitely many variables with respect to its basis of Schubert polynomials. Combinatorial methods, mainly related to the Bruhat order on the symmetric group, play a major role in our work.

This talk should be accessible to general faculty.