Topology, Algebraic Geometry, & Dynamics Seminar

On some (equivariant) combinatorics related to flag manifolds.

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Schubert calculus arose from 19th Century explorations of enumerative geometry, but has evolved into the study of specific rings associated with homogeneous spaces. The topic includes, for example, examining the product structure of the cohomology ring of the Grassmannian of k-dimensional subspace of complex n-space, or the equivariant cohomology ring of G/P, where P is a parabolic in a complex group G), as well as the K-theory or equivariant K-theory of the complete flag variety. In various geometrically motivated bases for each ring, the product of any two basis elements, expanded in that basis, has coefficients that are positive in an appropriate sense.

Remarkably, equivariant cohomology and K-theory–which take into account a group action by a torus T (an abelian group)–have some advantages over their non-equivariant counterparts, even as they have strictly more information. They can be described simply by a sequence of polynomials (in the case of cohomology), and rational functions (in the case of K-theory). This description is amenable to combinatorial methods and provides hope for future positive formulas on structure constants. I will give an overview of some results on positivity, as well as a some geometric (but unfortunately non-positive) formulas for computing them.

Date: **Friday, November 2, 2018**
Time: **2:30-3:20 pm**
Place: **4106 Exploratory Hall**

For special accommodations, please contact Sean Lawton via email at `slawton3@gmu.edu`.