

Queen's Algebraic Geometry — Seminar —

CONVEX POLYTOPES FOR ACTIONS OF ALGEBRAIC GROUPS ON VARIETIES

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Abstract

To each toric variety embedded in a projective space one associates a Newton polytope. The geometry of the toric variety is beautifully connected to the combinatorics of its Newton polytope. Toric varieties are in some sense simplest examples of algebraic group actions, namely they are equipped with an action of the group $(\mathbb{C} \setminus \{0\})^n$ and possess finite number of orbits. One naturally likes to extend the theory to actions of other algebraic groups, e.g. $GL(n, \mathbb{C})$ or $SL(n, \mathbb{C})$. I will show how one can generalize Newton polytopes to the more general setting of actions of reductive algebraic groups and explain the extensions of the theorems in toric geometry to this case. The examples include complete and partial flag varieties, completions of reductive groups and more generally regular symmetric varieties (in the sense of De Concini-Procesi) and finally spherical varieties. The talk is based on the results of the speaker as well as the previous results of Alexeev-Brion and Okounkov.

Monday, January 21, 2008
4:30pm – 5:30pm
319 Jeffery Hall