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Wall-crossing for Newton-Okounkov bodies: a glimpse of combinatorial symplectic and algebraic geometry

A surprising number of symplectic manifolds and algebraic varieties equipped with groups actions (i.e., symmetries) have explicit combinatorial structure. Applying combinatorial techniques to this data is an effective method for understanding both an individual geometric object and also the relationships between them. In this talk I will give a glimpse of this research area by discussing an ongoing project, joint with Laura Escobar, on a wall-crossing phenomenon for Newton-Okounkov bodies, which touches upon the above themes in multiple ways. More specifically, a Newton-Okounkov body is a convex set associated to a projective algebraic variety, equipped with a valuation. These bodies generalize the theory of Newton polytopes. Recent work of Kaveh-Manon gives an explicit link between tropical geometry and Newton-Okounkov bodies. We use this link to describe a wall-crossing phenomenon for Newton-Okounkov bodies, and discuss the specific case of the Grassmannian of 2-planes in complex m-space.