

Affine Mirkovic-Vilonen polytopes

Peter Tingley, Massachusetts Institute of Technology

Consider a symmetrizable Kac-Moody algebra. In finite type, Mirkovic-Vilonen (MV) polytopes give nice combinatorial realizations of Kashiwara's crystals. These polytopes were originally defined using the geometry of the affine grassmannian, but they also arise naturally in several other contexts including PBW bases, quiver varieties, and Khovanov-Lauda-Rouquier (KLR) algebras. These ideas make sense beyond finite type, giving several ways to extend the theory of MV polytopes. The story is nicest in affine type, and there all the constructions lead to identical combinatorial objects. This includes joint work with Pierre Baumann, Tom Dunlap, Joel Kamnitzer, Dinakar Muthiah and Ben Webster.