
STEVE RAYAN, University of Saskatchewan

Resolutions of finite quotient singularities and quiver varieties

Finite quotient singularities have a long history in mathematics, intertwining algebraic geometry, hyperkähler geometry, representation theory, and integrable systems. I will highlight the correspondences at play here and how they culminate in Nakajima quiver varieties, a class of moduli spaces that provide a useful testing ground for ideas in geometric representation theory and physics. I will motivate some recent work of G. Bellamy, A. Craw, T. Schedler, H. Weiss, and myself in which we show that, remarkably, all of the resolutions of a particular finite quotient singularity are realized as a certain Nakajima quiver variety, namely that of the 5-pointed star-shaped quiver. I will place this work in the wider context of the search for McKay-type correspondences for finite subgroups of $SL(n, \mathbb{C})$ on the one hand, and of the construction of finite-dimensional-quotient approximations to meromorphic Hitchin systems and their integrable systems on the other hand. The Hitchin system perspective draws upon my prior joint works with each of J. Fisher and L. Schaposnik, respectively. Time permitting, I will speculate upon the symplectic duality of Higgs and Coulomb branches in this setting.