Okounkov's conjecture via BPS Lie algebras

by

Prof. Ben Davison
University of Edinburgh

Abstract

Given an arbitrary finite quiver \( Q \), Maulik and Okounkov defined a new Yangian-style quantum group. It is built via their construction of \( R \) matrices on the cohomology of Nakajima quiver varieties, which in turn is constructed via their construction of stable envelopes. Just as in the case of ordinary Yangians, there is a Lie algebra \( g_Q \) inside their new algebra, and the Yangian is a deformation of the current algebra of this Lie algebra.

Outside of extended ADE type, numerous basic features of \( g_Q \) have remained mysterious since the outset of the subject, for example, the dimensions of the graded pieces. A conjecture of Okounkov predicts that these dimensions are given by the coefficients of Kac's polynomials, which count isomorphism classes of absolutely indecomposable \( Q \)-representations over finite fields. I will present a recent result with Tommaso Botta: we prove that the Maulik-Okounkov Lie algebra \( g_Q \) is isomorphic to a certain BPS Lie algebra constructed in my previous work with Sven Meinhardt. This implies Okounkov's conjecture, as well as essentially determining \( g_Q \), thanks to recent joint work of myself with Hennecart and Schlegel Mejia.

Date   : 11 January 2024 (Thursday)
Time   : 3:30pm – 5:00pm*
Venue  : Room 4503 (Lifts 25/26)

All are Welcome!