THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

ALGEBRA AND GEOMETRY SEMINAR

Okounkov's conjecture via BPS Lie algebras

by

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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!