"GEOMETRY OF DERIVED CATEGORIES AND REPRESENTATION THEORY"
workshop schedule

Monday 4/30

9:30-10:30 – Okounkov, "Quantum cohomology of Nakajima varieties"

11-12 – Keller, "Combinatorial DT invariants and cluster algebras, I"

1:30-2:30 – Goncharov, "Ideal webs and moduli spaces of local systems on surfaces"

3:00-4:00 – Bayer, "Projectivity and birational geometry of Bridgeland moduli space"

Abstract: I will present a construction of a nef divisor class on moduli spaces of Bridgeland-stable objects that is naturally associated to the stability condition. In the case of K3 surfaces, we use it to prove projectivity of the moduli spaces, thereby generalizing a recent result of Minamide, Yanagida and Yoshioka. The dependence of the divisor class on the stability condition gives a natural explanation for the correspondence between wall-crossing and birational geometry, as observed in examples Arcara-Bertram, Arcara-Bertram-Coskun-Huizenga and others. This is based on joint work with Emanuele Macri.

Tuesday 5/01

9:30-10:30 Keller, "Combinatorial DT invariants and cluster algebras, II"

11-12 Macri, "Bogomolov-Giesker inequality in higher dimension"

Abstract: In this seminar (based on joint work with A. Bayer, Y. Toda, and A. Bertram), we will present a conjectural approach to the construction of Bridgeland stability conditions on the derived category of a higher dimensional variety. The main ingredient is a generalization to complexes of the classical Bogomolov-Gieseker inequality for sheaves.

We will discuss several applications of this inequality. In particular, we will study the case of the 3-dimensional projective space and the connections with the Castelnuovo inequality for curves and the Fujita Conjecture.

1:30-2:30 Efimov, "Quantum cluster monomials via DT theory"

3:00-4:00 Kapranov, "Cubic relations in Hall algebras and zeroes of zeta functions."

4:15-5:15 – Gautam, "Yangians and quantum loop algebras".

Wednesday 5/02

9:30-10:30 Vasserot, "Affine W-algebras and quiver varieties."

10:45-11:45 Nagao, "Donaldson-Thomas theory and mapping class group"

Abstract: A 3-dimensional Calabi-Yau triangulated category may have non-trivial automorphism group. Such a symmetry is expected to provide some constraints in Donaldson-Thomas type theory for the category. In this talk, I will show an example of such a phenomenon.

Given a triangulation of a surface, a quiver with a potential is defined. Given a quiver with a potential, a 3-dimensional Calabi-Yau triangulated category (the derived category of GInzburg dga) is defined. The mapping class group of the original surface acts on the derived category. As a consequence, the Donaldson-Thomas theory is "invariant" under the mapping class group action.

1:15-2:15 Kamnitzer, "Quantizations of affine Grassmannian slices using subquotients of Yangians"

Abstract: We consider the slices to affine Schubert cells in the affine Grassmannian. These slices are Poisson varieties with a contracting $\mathbb{C}^*$ action. They play an important role in the geometric Satake correspondence. We define a conjectural quantization of these slices using subquotients of Yangians. This is joint work with Webster, Weekes and Yacobi.

2:45-3:45 Seidel, "Mirror symmetry for A_m resolutions and smoothings"

Thursday

9:30-10:30 Cautis "Vertex operator constructions"

10:45-11:45 Shan, "Cyclotomic rational Cherednik algebras and affine Lie algebras"

1:15-2:15 Rouquier, "Perverse Equivalences, I"

2:45-3:45 Ginzburg, "The affine Grassmannian and symplectic geometry related to G/U."

Friday

9:30-10:30 Rouquier, "Perverse Equivalences, II"

10:45-11:45 Stroppel, "Generalized Kazhdan-Lusztig polynomials and completed Grothendieck groups"

1:15-2:15 Webster, "The representation theory of symplectic singularities."

2:45-3:45 Losev, "Highest weight categorical sl_2-actions"

Abstract: We are going to discuss categorical actions of sl_2 on highest weight categories. We will mention structural results, applications to cyclotomic Rational Cherednik algebras and some open problems.