ABSTRACTS

Andrea D'Agnolo (University of Padova)

Title: On the Riemann-Hilbert correspondence

Abstract: The classical Riemann-Hilbert correspondence establishes an equivalence between the triangulated categories of regular holonomic D-modules and of constructible sheaves. In a joint work with Masaki Kashiwara, we proved a Riemann-Hilbert correspondence for holonomic D-modules which are not necessarily regular. The construction of our target category is based on the theory of ind-sheaves by Kashiwara-Schapira and is influenced by Tamarkin's work on symplectic topology. Among the main ingredients of our proof is the description of the structure of flat meromorphic connections due to Mochizuki and Kedlaya. I will survey this construction, sweeping under the carpet the most technical parts, and focusing on examples in dimension one.

Akishi Ikeda (IPMU, University of Tokyo)

Title: Spaces of stability conditions on the Calabi-Yau categories associated with quivers

Abstract: The aim of this lecture is to introduce the spaces of Bridgeland stability conditions on the Calabi-Yau categories associated with quivers. In the first part, we introduce the space of Bridgeland stability conditions on a triangulated category and review its basic properties. We also see examples of stability conditions. In the second part, we see known results about the spaces of stability conditons on the derived categories of Calabi-Yau algebras of quivers in terms of root systems and period integrals.

Tatsuki Kuwagaki (University of Tokyo)

Title: An introduction to the coherent-constructible correspondence

Viktor Ostrik (University of Oregon)

Title: Affine branching laws and tensor categories

Abstract: In these talks we will describe an approach to branching laws for highest weight integrable representations of affine Lie algebras based on fusion product and modular tensor categories. Our main emphasis will be on branching laws related with level rank duality.

Vivek Shende (University of California, Berkeley)

Title: Fukaya cosheaves

Abstract: Kontsevich conjectured that the wrapped Fukaya category of a Weinstein manifold should be computable as the global sections of some cosheaf of categories

over its Lagrangian skeleton. I will describe how to make this precise, and how to prove it. This is joint work with Sheel Ganatra and John Pardon.

Title: Mirror symmetry for very affine varieties

Abstract: Using tropical methods, I will describe the skeleton for the general hyper surface cut out by a Laurent polynomial with only one term in the interior of its newton polytope. This turns out to agree with the skeleton introduced by Fang, Liu, Treumann, and Zaslow. Using the work of Kuwakagi, a new functoriality statement for the coherent-constructible correspondence, and the cosheafification result discussed in the previous talk, we deduce that the wrapped Fukaya category of the hyper surface is equivalent to the derived category of coherent sheaves on the boundary divisor in a certain toric stack.

Andrey Smirnov (University of California, Berkeley)

Title: Integrable systems and quantum geometry

Abstract: In my talk I will overview new classes of integrable systems associated with Nakajima quiver varieties. I will explain the geometric construction of quantum R-matrices, commuting families of Hamiltonians and corresponding Bethe equations. I will discuss relations of these systems with quantum cohomology and quantum K-theory of Nakajima varieties.

Dmitry Tonkonog (University of California, Berkeley)

Title: Mutations of Lagrangian tori

Abstract: I will overview a beautiful interplay between the symplectic geometry of monotone Lagrangian tori in del Pezzo surfaces and the algebra of mirror Landau-Ginzburg models, following the works of Auroux, Vianna, Galkin-Cruz Morales, Shende-Treumann-Williams, and Pascaleff with myself. Time permitting, I will discuss mutations of Lagrangian tori in higher-dimensional toric Fanos.

Kazushi Ueda (University of Tokyo)

Title: Dimer models and homological mirror symmetry

Abstract: A dimer model is a bicolored graph on a real 2-torus encoding the information of a quiver with potential. It originates from statistical mechanics, and is related to various branches of mathematics. In the talk, we will give an introduction to the theory of dimer models and its application to homological mirror symmetry.

Michael Viscardi (University of California, Berkeley)

Title: Quantum cohomology and 3D mirror symmetry

Abstract: We give an introduction to 3D mirror symmetry/symplectic duality, with an emphasis on the recent construction of the Coulomb branch by Braverman-Finkelberg-Nakajima. In examples where a symplectic resolution of the Coulomb branch exists, we explain how to compute its equivariant quantum connection.

Masahito Yamazaki (IPMU, University of Tokyo)

Title: Integrability lattice models from four-dimensional gauge theory

Abstract: I will describe my recent work with Kevin Costello and Edward Witten, on explaining integrable models from a four-dimensional gauge theory.