1. Alexander Belavin

Title: Saito Frobenius manifolds and Minimal string theory.

Abstract:

The aim of this talk is to report about a computation of the correlation numbers in (p,q) Minimal Liouville gravity (MLG). In this work, we conjecture that the Douglas equation, which arise in Matrix Models for 2D gravity, is applicable also to the Minimal Liouville gravity. This conjecture requires the following two questions to be answered: how to choose the desired solution of the Douglas string equation and an appropriate form of the so-called resonance transformation from the KdV times to the Liouville coupling constants to satisfy the needed constraints which have to be fulfilled in MLG. In our study, using the approach to MLG based on the connection of the String equation with the special case of Frobenius manifolds which we call Saito Frobenius manifolds, we find the necessary solution of the String equation. We also show that this solution together with the suitably chosen resonance transformation leads to the results which are consistent with the main requirements of $(p,q)$ models of MLG (the so called selection rules). It is remarkable that the needed solution of the Douglas equation has a very simple form in the Flat coordinates on the Frobenious manifold in the general case of (p,q) Minimal Liouville.

1. Agnieszka Bodzenta

Title: A spherical pair for a flop

Abstract: Consider varieties X and X^+ related by flops f: X \to Y, f^+: X^+ \to Y with fibers of dimension less than or equal to one. The null category for f is the category of sheaves on X with vanishing derived direct image. I will show that the derived categories of null categories for f and f^+ form a spherical pair in an appropriate quotient of the derived category of the fiber product of X and X^+ over Y. The associated auto-equivalence of the derived category of X is the flop-flop functor. This is a joint work with A. Bondal.

1. Chris Brav

Title: Calabi-Yau categories with boundary

Abstract: We propose a definition of Calabi-Yau structure or relative orientation on a morphism S --> T of dg categories in terms of certain data on negative cyclic homology. When S=0 is the zero category, this recovers the usual notion of Calabi-Yau structure on a smooth dg category T. The basic examples come from derived local systems on an oriented manifold and on its boundary and from derived categories of coherent sheaves on a Fano variety and on an anti-canonical divisor.

Our main result is that we can compose co-correspondences with relative orientations, allowing us to produce by gluing many interesting examples of dg categories with Calabi-Yau structure. If time permits, we also explain how if a morphism S --> T is endowed with relative orientation induced by a Calabi-Yau structure on S, then the induced map of moduli of objects M\_T --> M\_S is Lagrangian for the natural shifted symplectic structure on M\_S induced by the Calabi-Yau structure on S.

This is joint work with Tobias Dyckerhoff.

1. Will Donovan

Title: Twists and braids for general 3-fold flops

Abstract: When a 3-fold contains a floppable curve, there is an associated equivalence between the derived categories of the 3-fold and its flop. For a reducible curve, there may exist multiple such flop functors, corresponding to different irreducible curve components. I will discuss joint work with Michael Wemyss showing that these flop functors satisfy Coxeter-type braid relations which are controlled by a certain simplicial hyperplane arrangement, and give applications.

1. Alexey Elagin

Title: Constructivity of exceptional collections of line bundles on surfaces.

Abstract: For an exceptional collection of line bundles on a surface, its toric system is defined as a sequence of ``differences'' between objects of a collection. For a toric system on X and a blow up of X at a point, Hille and Perling proposed a way to augment the toric system by adding one more divisor, thus getting a toric system on the blow up. Starting from a toric system on a minimal rational surface and making such operations at each blow up, one can get a plenty of toric systems on rational surfaces. They are called standard augmentations. Conjecturally, any toric system of a full strong exceptional collection on a rational surface is a standard augmentation. We demonstrate that this is true for del Pezzo surfaces.

1. Anton Fonarev

Title: The derived categories of curves as components of Fano varieties

Abstract: A well known result of Beilinson gives an amazingly simple description of the bounded derived category of coherent sheaves on the projectile line. However, a smooth projective curve C of positive genus does not admit nontrivial semi-orthogonal decompositions. An interesting question is whether such a category can be realised as a semi-orthogonal component of a smooth Fano variety. In particular, it is conjectured that D(C) embeds fully and faithfully into the derived category of the moduli space of rank 2 stable vector bundles on C. We are going to prove this conjecture for a generic curve C. Based on a joint work with Alexander Kuznetsov.

1. Sergey Galkin

Title: Counting rational curves on abelian varieties is a moonshine with delightful byproducts.

Abstract: Moonshine and vodka flow like a river,

midnight in Moscow is breakfast time in Kashiwa.

1. Kentaro Hori

Title: The grade restriction rule in Rodland model

Abstract: Employing the hemisphere partition function, we find the grade restriction rule in

"Rodland model" which yields the Pfaffian/Grassmannian correspondence of B-branes. We find an equivalence for each homotopy class of paths (a window) between the Pfaffian and the Grassmannian phases, and the monodromy around each of the three singular points in the middle.

1. Akishi Ikeda

Title: Stability conditions of the Calabi-Yau completion for a formal parameter

Abstract: In this talk, we define a variant of a Bridgeland stability condition on the derived category of the Calabi-Yau completion for a formal parameter. The space of these stability conditions becomes a complex manifold and admits the action of complex numbers and autoequivalences. In particular, the action of a complex number $s$ coincides with the action of the Serre functor which is given by the shift of the formal parameter. We also discuss the relationship between central charges of these stability conditions and twisted periods of the Frobenius manifold.

1. Hiroshi Iritani

Title: Mirror symmetry for toric stacks and its application

Abstract: We describe a global Landau-Ginzburg model mirror to toric stacks. This has an application to functoriality of quantum cohomology (and quantum D-modules).

1. Mikhail Kapranov

Title: Perverse Schobers on surfaces and Fukaya categories with coefficients

Abstract: Perverse Schobers are conjectural categorical generalizations of perverse sheaves. I will explain a precise definition of a Schober smooth with respect to a normal crossing divisor N in a complex manifold X. This includes the case when X is a Riemann surface and N a finite set of points. In this case I will present a construction of a topological Fukaya category with coefficients in a Schober. This can be seen as the categorical analog of the first cohomology with coefficients in a perverse sheaf. This is a joint work with T. Dyckerhoff, Y. Soibelman and V. Schechtman.

1. Ilya Karzhemanov

Title: Explicit Dolgachev surfaces, exceptional collections, and phantoms

Abstract: I will describe one explicit construction of a Dolgachev surface, exceptional collection on it, and the so-called 'phantom' that appears.

1. Yujiro Kawamata

Title: On some derived McKay correspondences

Abstract: I will talk about the derived McKay correspondences for finite abelian groups and finite subgroups of GL(2, C).

1. Alexander Kuznetsov

Title: Categorical joins - II

Abstract: I will remind the definition of a categorical join and report on new developments. In particular, I will describe the Lefschetz decomposition of the categorical join induced by Lefschetz decompositions of the original varieties and speculate on the kernel object for the HP duality. I will also try to discuss some interesting examples of semiorthogonal decompositions, which would follow from the homological projective duality for categorical joins.

1. Todor Milanov

Title: A Gamma Hodge structure

Abstract: It is expected that a manifold X with semi-simple quantum cohomology has a Landau--Ginzburg mirror model. Moreover, following Iritani we can introduce an integral structure in quantum cohomology which is expected to correspond via mirror symmetry to the Milnor lattice associated with a certain LG potential. On the other hand, usually the vanishing cohomology corresponding to the LG potential carries a polarized mixed Hodge structure. Motivated by the above mirror symmetry expectations, we obtain some interesting candidate for a mixed Hodge structure in the cohomology of X. My expectation is that after unfolding the complicated definition of a mixed Hodge structure we obtain several numerical constraints for manifolds with semi-simple quantum cohomology.

1. Shinnosuke Okawa

Title: On semi-orthogonal decompositions of derived category of surfaces with non-negative Kodaira dimensions

Abstract: In the last four years, using exceptional collections, many examples of (quasi-)phantom categories have been discovered on minimal surfaces of positive Kodaira dimensions with $p\_g = 0$. On the other hand, on surfaces with $p\_g > 0$, I expect that essentially any SOD should come from the MMP. In this talk I will show some techniques to classify SODs, and use them to give several results supporting the expectation. I would also try to describe the remaining issues.

1. Yuri Prokhorov

Title: Flips and divisorial contractions of exceptional type

Abstract. I would like to discuss three-dimensional flips and divisorial contractions that contain a terminal exceptional singularity of index 4.

1. Victor Przhiyalkovskiy

Title: On Hodge numbers for Landau--Ginzburg models

Abstract: We discuss various definitions of Hodge numbers for Landau—Ginzburg models and their relation to Hodge numbers of Fano varieties.

1. Alexey Rosly

Title: Superconnections and Chern classes of coherent sheaves

Abstract:

1. Yuuki Shiraishi

Title: Frobenius manifolds constructed from invariant theory of extended cuspidal Weyl groups

Abstract: This talk is based on the joint work with Prof. A Takahashi. In this talk, I will explain how to construct the Frobenius structure on the invariant theory of an extended cuspidal Weyl group under certain conjecture (called Property P). This Frobenius structure is expected to be isomorphic to the one constructed from the Gromov--Witten theory of a corresponding orbifold projective line. This isomorphism can be shown via the reconstruction theorem, which was presented in my previous talk.

1. Kazushi Ueda

Title: Non-commutative Hirzebruch surfaces

Abstract: The theory of non-commutative P^1-bundles over commutative schemes is developed by Mori, Nyman, Patrick, Van den Bergh, and so on. In the talk, we discuss the case when the base scheme is P^1 in detail, and compare it with non-commutative quadrics, studied by Van den Bergh based on an earlier work of Bondal-Polishchuk. This is a joint work with Izuru Mori and Shinnosuke Okawa.

1. Elisabeth Werner

Title: Orbifold Jacobian Algebras for Invertible Polynomials

Abstract:

Let f be a quasihomogeneous polynomial with an isolated singularity at the origin. The Jacobian algebra of f is the local algebra of its partial derivatives. It is finite dimensional and has the structure of a Frobenius algebra. We consider a group action on f. Let G be a finite group of symmetries of f. The pair (f,G) is often called a Landau-Ginzburg orbifold. We want to construct an orbifold version of the Jacobian algebra for the pair (f,G). This is a joint work with Alexey Basalaev and Atsushi Takahashi.