# Abstracts

## Eyal Markman

Title: Morrison's movable cone conjecture for projective irreducible holomorphic symplectic manifolds

Abstract: Let X be a smooth projective variety with a numerically trivial canonical line bundle. The ample and movable cones of X can have infinitely many linear boundary faces, as well as circular boundary faces, and are often quite complicated. Morrison's cone conjectures state, roughly, that the ample cone is simple modulo the action of the automorphism group of X, and the movable cone is simple modulo the action of the group Bir(X) of birational automorphisms of X. We prove a version of the movable cone conjecture in the title as a consequence of the Global Torelli Theorem for irreducible holomorphic symplectic manifolds. As a consequence it is shown that for each non-zero integer d there are only finitely many Bir(X)-orbits of complete linear systems, which contain a reduced and irreducible divisor of Beauville-Bogomolov degree d. A variant hold for degree zero as well.

#### JongHae Keum

## Title: Algebraic Montgomery-Yang problem on Q-homology projective planes

Abstract: The Montgomery-Yang problem, posed by R. Fintushel and R. Stern, predicts that every pseudofree circle action on the 5-dimensional sphere has at most 3 non-free orbits. Using a certain one-to-one correspondence, J. Kollár formulated the algebraic version: every projective surface with quotient singularities having the second Betti number 1 has at most 3 singular points if its smooth locus is simply connected. I will report on the recent progress on this problem, mostly on the joint work with D. Hwang. We have confirmed the conjecture except the case where the surface is a rational surface with ample canonical class having at worst cyclic singularities.

## Mark Gross

Title: Mirrors of rational surfaces and smoothing surfaces singularities

Abstract: I will discuss joint work with Paul Hacking and Sean Keel. We construct a mirror family for any pair (Y, D), where Y is a rational surface and D is an anticanonical cycle of rational curves. In the case that D is contractible (necessarily to a cusp singularity), we obtain a smoothing of the dual cusp, proving a conjecture of Looijenga characterizing smoothable cusp singularities.

#### Valery Lunts

Title: Lefschetz fixed point theorems for algebraic varieties and DG algebras

Abstract: I will report on my work about a version of Lefschetz fixed point theorem for morphisms (more generally for Fourier-Mukai transforms) of smooth projective varieties. There is also a parallel version for smooth and proper DG algebras.

## Yi Hu

# Title: Derived resolution and desingularization of moduli of stable maps

Abstract: This talk will focus on two related problems: resolution of singularities and applications to Gromov-Witten invariants. First, I will describe a canonical way to resolve any perfect derived object over a Deligne-Mumford stack. This can be applied to define the high genus reduced Gromov-Witten numbers for smooth Calabi-Yaus. Secondly, the idea of the derived resolution also helps to resolve the singularities of the moduli of stable maps – this can be carried out for low genera. This is joint work with Jun Li.

# Lev Borisov

#### Title: On the better behaved version of the GKZ hypergeometric system

Abstract: This is a joint work with Paul Horja. We give an elementary description of a version of GKZ hypergeometric system. In contrast with the usual GKZ system, the rank of this new system is always the expected one. It appears naturally in the context of mirror symmetry.