Korea-Japan Joint Conference in Algebraic Geometry

Date : 19 ~ 23. Aug. 2012

Place : Gunsan, Ritz-Plaza Hotel

Time	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug
09:20-10:20	●Depart from KIAS at **11a.m.**	K. Kawatani	D. Kim	S. Choi	D. Hyeon
10:40-11:40	●Depart from Lotte City Hotel at **11:40 a.m.**	K. Han	A. Sannai	Y. Gongyo	A. Ito
12:00-14:00	Lunch	Lunch	Lunch (11:40-12:30)	Lunch	Lunch
14:00-15:00	Arrive at Gunsan Ritz plaza Hotel	T. Uehara	Cruise ship tour (12:30-18:30)	D. Hwang	Depart for Seoul at **2p.m.** after Lunch
15:20-16:20		I. Choe		S. Okawa	
16:40-17:40		K. Chung		T. Okada	
18:30~	Dinner	Dinner	Dinner	Dinner	

Title and Abstract

Insong Choe (Konkuk Univ.)

Title: Higher secant varieties and Segre invariants of orthogonal/symplectic bundles

Abstract: Generalizing the Segre invariant of ruled surfaces, one can define invariants of orthogonal/symplectic bundles over a curve measuring the degree of stability. We discuss how these invariants are related to the higher secant varieties inside the relevant extension spaces. Also we present some new results on the stratifications on the moduli of orthogonal/symplectic bundles. This is a joint work with Goerge H. Hitching.

Sung Rak Choi (POSTECH)

Title: On partially ample divisors.

Abstract: The ample divisors on a variety are defined geometrically as the divisors such that the linear system of its multiple defines an embedding of the variety into some projective space. There are also numerical, cohomological, and asymptotic cohomological characterizations of ample divisors. By relaxing the conditions in these characterizations we obtain the notions of so-called partially ample divisors, that are slightly different from each other. We will study their properties and under what conditions the notions coincide.

Kiryong Chung (KIAS)

Title: Geometry of the moduli space of semistable sheaves on the projective plane.

Abstract: As a compactification of the relative Jacobian variety over integral curves in the projective plane $\mathbb{P}^2$, one can consider the moduli space $\mathbf{M}$ of semistable sheaves of dimension one. Because of the lack of geometry of the boundary points, very few things about the space $\mathbf{M}$ are known except that it is an irreducible, normal and $\mathbb{Q}$-factorial variety with (at most) the rank two Picard group. In this talk, we study the geometry of the space $\mathbf{M}$ by using the stable pairs space. As corollaries,

(1) we run the log minimal model program for $\mathbf{M}$ and

(2) we suggest a method of the proof of the BPS conjecture for the local $\mathbb{P}^2$: wall-crossing formular.

These are working in progress with J. Choi.

Yoshinori Gongyo (Univ. Tokyo)

Title: Remarks on the non-vanishing conjecture

Abstract: I will talk about some remarks on the non-vanishing conjecture for pseudo-effective log canonical divisors. I will discuss a difference between the rational and the real non-vanishing conjecture for pseudo- effective log canonical divisors of log canonical pairs. I also will introduce the proof of the log non-vanishing theorem for rationally connected varieties using Shokurov's ACC conjectures.

Kangjin Han (KIAS)

Title: Structures of the linear strands of free resolutions and generalized K_{p,1}-theorem

Abstract: In 1980's, Mark Green initiated the work connecting algebraic geometry and structure of free resolution. Following his spirit, there have been many subsequent works to various directions.
In this talk, we're going to consider structures of linear strands of minimal free resolution of projective subschemes. Especially, we'll get an effective bound for the graded Betti numbers in the linear strands of Betti tables of some algebraic sets and obtain a generalized version of Green's K_{p,1}-theorem as an application.

DongSeon Hwang (Ajou Univ.)

Title: Redundant blow-ups and Cox rings of rational surfaces

Abstract: We introduce the notion of redundant blow-ups based on Sakai's work to construct rational surfaces with finitely generated Cox rings. As an application, we construct series of new examples of rational surfaces with anticanonical Iitaka dimension 0 and $-\infty$ty of arbitrarily large Picard number whose Cox rings are finitely generated. This method is also applied to study the classification of rational surfaces with big anticanonical divisor. In particular, we construct smooth projective rational surfaces with big anticanonical divisor that are not minimal resolutions of del Pezzo surfaces containing at worst rational singularities.

Donghoon Hyeon (POSTECH)

Title: Birational geometry of moduli space of stable curves

Abstract: In this survey talk, I will describe interesting problems and some recent developments regarding birational geometry of moduli space of stable curves.

Atsushi Ito (Univ. Tokyo)

Title: Seshadri constants and degrees of defining polynomials

Abstract: Seshadri constant is an invariant which measures the local positivity of ample line bundles. In this talk, I will explain that the Seshadri constant is bounded from below by the degrees of the defining polynomials for a variety embedded in a projective space. Applying this lower bound, we can compute the Seshadri constants explicitly for any complete intersection Fano variety of a rational homogeneous space of Picard number 1. This is a joint work with Makoto Miura.

Kotaro Kawatani (Osaka Univ.)

Title: A hyperbolic metric and stability conditions on K3 surfaces with Picard rank 1

Abstract: We introduce a hyperbolic metric on the (normalized) space of stability conditions on projective K3 surfaces X with Picard rank 1. Furthermore we demonstrate how this hyperbolic metric is helpful for us by discussing some topics

Dano Kim (Seoul National Univ.)

Title: Extension of sections and Log-canonical centers

Abstract: L^2 extension of Ohsawa-Takegoshi type for a submanifold Y in a complex manifold X was first proved when the codimension of Y is equal to 1 and the normal bundle of Y is trivial. Since then there have been many generalizations and applications, for example allowing the manifolds to have singularities and the codimension to be higher. We will first give an overview and comparison on these generalizations and then discuss the relevance and possible generalization of the notion of a log-canonical center in this context.

Takuzo Okada (Saga Univ.)

Title: Birationally birigid Q-Fano threefolds

Abstract: I will talk about explicit studies on the birational geometry of Q-Fano threefold weighted complete intersections of codimension two. I will explain which one is birationally rigid or not, and exhibit examples of birationally birigid Q-Fano threefolds.

Shinnosuke Okawa (Univ. Tokyo)

Title: Derived category of smooth proper Deligne-Mumford stack with $p\_g>0$

Abstract: Semiorthogonal decomposition (SOD) of the derived category of coherent sheaves reflects interesting geometry of varieties (more generally stacks), such as minimal model program. We show that the global sections of the canonical line bundle (if exists) give restrictions on the possible form of SODs. As a special case, we see that the global generation of the canonical line bundle implies the non-existence of SODs. This is a joint work with Kotaro Kawatani.

Akiyoshi Sannai (Univ. Tokyo)

Title: Dual F-signature

Abstract: The F-signature was introduced by Huneke and Leuschke as an invariant of local rings of positive characteristic. Huneke-Leuschke and Aberbach-Enescu gave characterizations of regular and F-regular rings by using it. I define the dual F-signature of modules which coincide with the F-signature for the base ring R, to give characterizations of regular, F-regular, F-rational and Gorenstein local rings.

Takato Uehara (Tohoku Univ.)

Title: On automorphisms of rational surfaces

Abstract: This talk is concerned with automorphisms on rational surfaces. I develop a method for constructing automorphisms in terms of realizations of orbit datum, and show that any automorphism preserving an anticanonical curve with a cusp singularities, called a cuspidal anticanonical curve, is constructed from a realization of an orbit data. Moreover, I determine automorphisms groups of rational surfaces admitting such automorphisms with positive entropy, and also determine the set of entropy values of rational surface automorphisms.