

Taeyong Ahn *Inha University, Korea*

Equidistribution of positive closed currents on a compact Kähler manifold

Abstract. In this talk, we start with an introduction to the complex dynamics and the Fatou-Julia theory in complex dynamics. Our main object in the discussion is the Julia set. We discuss the equidistribution of inverse images of points and analytic subsets on the projective space and the relationship with the Julia set. Then, we move to more general spaces such as compact Kähler manifolds. This is an example showing how geometric properties affect dynamical phenomena. The last part comes from an ongoing joint work with Prof. Duc-Viet Vu.

Ye-Won Luke Cho *Pusan National University, Korea*

Continuity of singular Kähler-Einstein potentials

Abstract. Eyssidieux-Guedj-Zeriahi showed in 2009 that any compact normal Kähler variety with trivial or ample canonical \mathbb{Q} -line bundle admits a singular Kähler-Einstein (SKE) metric, generalizing the works of Aubin and Yau. A SKE potential generating the SKE metric is known to be locally Hölder continuous on the regular locus of the variety. But understanding the regularity of the potential on the singular locus still remains to be a major open problem. In this talk, we show that any SKE potential on a compact normal Kähler variety is continuous on the whole variety. As an application, we also prove that the potential of the Kähler-Ricci flow on a compact Kähler variety X constructed by Guedj-Lu-Zeriahi (2020) is continuous on $X \times (0, \infty)$. This is joint work with Y.-J. Choi.

Young-Jun Choi *Pusan National University, Korea*

An injectivity theorem on snc compact Kähler spaces

Abstract. The injectivity theorem, a generalization of the Kodaira vanishing theorem to semi-positive line bundles, plays an important role in higher dimensional algebraic geometry. After the original Kollár's injectivity theorem had been proved for semi-ample line bundles on smooth projective varieties, Enoki generalized Kollár's injectivity theorem to semi-positive line bundles on compact Kähler manifolds. Kollár's proof is based on theory of Hodge structures, whereas Enoki's proof is based on the theory of harmonic integrals, a more well-suited and flexible technique in the complex analytic situation. Ambro and Fujino generalized Kollár's theory to varieties with lc singularities via the theory of mixed Hodge structures, motivated by applications to birational geometry. It is expected that their works can also be generalized in the same line as Enoki's by developing an analytic treatment to lc singularities, which is known as Fujino's conjecture.

In this talk, we discuss the injectivity theorem for snc compact Kähler spaces, which implies the Fujino's conjecture. This is a joint work with Tsz On Mario Chan and Shin-ichi Matsumura.

Pham Hoang Hiep *Vietnam Academy of Science and Technology, Vietnam*

Singularity invariants of plurisubharmonic functions

Abstract. In my talk, I will present some recent results on singularity invariants of plurisubharmonic and holomorphic functions.

Dinh Tuan Huynh *Hue University of Education-Hue University, Vietnam*

Universal entire curves in projective spaces with slow growth

Abstract. We construct universal entire holomorphic curves $h : \mathbb{C} \rightarrow \mathbb{CP}^n$ whose Nevanlinna characteristic functions grow slower than any preassigned transcendental growth rate. This answers a question asked by Dinh-Sibony in an extended version. The talks are based on the recent joint work with Song Yan Xie and Zhangchi Chen.

Lukasz Kosinski *Jagiellonian University, Poland*

A Gehring-Hayman inequality

Abstract. We will prove that in a strongly pseudoconvex domain with a smooth boundary, the length of a geodesic for the Kobayashi-Royden infinitesimal metric between two points is bounded by a constant multiple of the Euclidean distance between the points. If time permits, we will also present sharp upper and lower bounds of the same type for the Kobayashi distance of a $C^{2,\alpha}$ -smooth strongly pseudoconvex domain. These bounds extend the well-known Balogh-Bonk estimate (2000). The talk is based on joint works with N. Nikolov, P. Thomas and A. Okten.

Kang-Hyurk Lee *Gyeongsang National University, Korea*

The method of potential rescaling and a characterization of the unit ball

Abstract. In the study of complex model domains, the affine rescaling method has been a fundamental approach to classify them. A typical application of this method is to show the existence of 1-parameter family of automorphisms on a domain with noncompact automorphism group; for instance, the Bedford-Pinchuk theorem on finite type domains and Frankel's theorem on convex domains. The affine rescaling method is to stretch coordinates according to asymptotic behavior of an automorphism orbit and the boundary geometry near an orbit accumulation point, and then to give an unbounded model domain corresponding to the orbit accumulation point.

Recently, we introduced the potential rescaling method to replace the affine rescaling method for abstract complex manifold. This method is to rescale a potential of Kähler-Einstein metric by automorphisms and construct a specific potential which generates a complete holomorphic vector field. This gives an intrinsic generalization of the Wong-Rosay theorem which says that a smoothly bounded domain with a compact quotient is biholomorphic to the unit ball. In this talk, I will introduce the potential rescaling method and its applications.

Man-Chun Lee *The Chinese University of Hong Kong, China*

Kähler-Ricci flow on non-compact manifolds and application

Abstract. In this talk, we will discuss the existence theory of Kähler-Ricci flow when the Kähler metric has unbounded curvature. We will discuss some application of the Kähler-Ricci flow in the study of uniformization and the regularity of Gromov-Hausdorff limit. This is based on joint work with L.-F. Tam.

Hoseob Seo *Institute for Basic Science, Korea*

Ohsawa measures on singular hypersurfaces and its applications

Abstract. In L^2 extension theorems from an irreducible singular hypersurface in a complex manifold, important roles are played by certain measures such as the Ohsawa measure, which determines when a given function can be extended. In this talk, we show that the singularity of the Ohsawa measure can be identified in terms of algebraic geometry. Using this, we give an analytic proof of the inversion of adjunction in this setting. These considerations enable us to compare various positive and negative results on L^2 extension from singular hypersurfaces. In particular, we generalize a recent negative result of Guan and Li which places limitations on strengthening such L^2 extension by employing a less singular measure in the place of the Ohsawa measure. This is joint work with Dano Kim.

Guolei Zhong *Institute for Basic Science, Korea*

Compact Kähler threefolds with the action of an abelian group of maximal dynamical rank

Abstract. Let X be a compact Kähler manifold and let G be an abelian subgroup of the full automorphism group $\text{Aut}(X)$. The group G is said to be of positive entropy, if for any element $g \in G$, its first dynamical degree $d_1(g)$ is greater than 1. It is proved by Dinh and Sibony that, if G is of positive entropy, then G is a free abelian group with rank no more than $\dim(X) - 1$. In the past decade, when X is projective, the geometry of the extremal case $\text{rank}(G) = \dim(X) - 1$ (being maximal) has been intensively studied by Zhang. In this talk, we consider the case when X is not necessarily projective. Following a strategy developed by Zhang and assuming the abundance conjecture, we show that if G achieves the maximal rank, then either X is rationally connected or the Kodaira dimension of X is zero. In particular, when $\dim(X) = 3$ and $\text{rank}(G) = 2$, we establish the G -equivariant log minimal model program for X ; consequently, we show that such X is either rationally connected, or bimeromorphic to a quasi-étale quotient of a complex 3-torus.