Recent Developments in Algebraic Geometry

Department of Mathematics, National University of Singapore
Building S17, Level 5F, Room #05-12

Wednesday 24th January 2018

10:00am – 11:00am
Speaker: Tien-Cuong Dinh (National U of Singapore)
Title: A surface with discrete and non-finitely generated automorphism group

11:15am – 12:15pm
Speaker: Jongil Park (Seoul National U)
Title: A Lefschetz fibration structure on minimal symplectic fillings of a quotient surface singularity

2:00pm – 3:00pm
Speaker: Sijong Kwak (KAIST)
Title: Threefold in P^5: multisecant and regularity

3:15pm – 4:15pm
Speaker: Sheng Meng (National U of Singapore)
Title: On polarized and amplified endomorphisms of normal projective varieties

4:30pm – 5:30pm
Speaker: JongHae Keum (KIAS)
Title: TBA

Organizers: JongHae Keum (KIAS) and De-Qi Zhang (NUS)
Abstracts.

**Tien-Cuong Dinh (NUS)**

Title: A surface with discrete and non-finitely generated automorphism group

Abstract: We show that there is a smooth complex projective variety, of any dimension greater than or equal to two, whose automorphism group is discrete and not finitely generated. Moreover, this variety admits infinitely many real forms which are mutually non-isomorphic over R. The talk is based on a joint work with Keiji Oguiso arXiv:1710.07019.

**Sheng Meng**

Title:

Abstract:

**Jongil Park (SNU, Seoul)**

Title: A Lefschetz fibration structure on minimal symplectic fillings of a quotient surface singularity

Abstract: Since it was known that any closed symplectic 4-manifold admits a Lefschetz pencil and that a Lefschetz fibration structure can be obtained from a Lefschetz pencil by blowing-up the base loci, the study of Lefschetz fibrations has become an important research theme for understanding symplectic 4-manifolds topologically. Furthermore, it is also one of active research topics in symplectic 4-manifolds to classify symplectic fillings of certain 3-manifolds equipped with a contact structure. Among them, people have long studied symplectic fillings of the link of a quotient surface singularity. For example, P. Lisca classified symplectic fillings of cyclic quotient singularities whose corresponding link is lens space, and M. Bhupal and K. Ono classified all possible symplectic fillings of non-cyclic quotient surface singularities. And then, J. Park together with Heesang Park, Dong-soo Shin, and Giancarlo Urzúa constructed an explicit one-to-one correspondence between the minimal symplectic fillings and the Milnor fibers of non-cyclic quotient surface singularities.

By the way, M. Bhupal and B. Ozbagci found an algorithm to present each minimal symplectic filling of a cyclic quotient surface singularity as an explicit positive allowable Lefschetz fibration, called PALF, structure. Furthermore they showed that each PALF structure can be obtained from the minimal resolution by monodromy substitutions which correspond to rational blow-downs topologically. In this talk, I’d like to explain how to construct an explicit PALF structure on any
minimal symplectic filling of the link of non-cyclic quotient surface singularities. This is a joint work with Hakho Choi.

**JongHae Keum (KIAS, Seoul)**

Title: TBA

Abstract

**Sijong Kwak (KAIST, Daejeon)**

Title: Threefold in $\mathbb{P}^5$: multisecant and regularity

Abstract:

**Sheng Meng (NUS)**

Title: On polarized and amplified endomorphisms of normal projective varieties

Abstract:

Let $X$ be a normal projective variety over an algebraically closed field $k$ of characteristic 0. We consider a non-isomorphic polarized endomorphism $f$ of $X$, that is $f^*L$ is linearly equivalent to $qL$ for some ample Cartier divisors $L$ and $q>1$.

In this talk, we'll first give a rough characterization of $X$ related to its singularities, canonical divisor, MRC fibration and Albanese map, etc. We’ll then show that one can run the minimal model program (MMP) $f$-equivariantly, after replacing $f$ by a positive power, for a mildly singular $X$. In the end, we’ll generalize part of the above results to the case of positive characteristic and the case of int-amplified $f$, that is $f^*L-L = H$ for some ample Cartier divisors $L$ and $H$.

Some results are joint works with Paolo Cascini and De-Qi Zhang.