Workshop

Recent Development in Algebraic Geometry

Organizers: Jia Jia, Wing-Keung To and De-Qi Zhang, Mathematics, NUS

Singapore Time (GMT + 8)

Time	Speaker
0855 – 0955	Long Wang (U Tokyo)
0955 – 1055	Ichiro Shimada (Hiroshima University)
1055 – 1155	Jia Jia (NUS)
1200 – 1400	Lunch Break
1400 – 1500	Fabio Perroni (U Trieste)
1500 – 1600	Yohsuke Matsuzawa (Rikkyo U/Osaka Metropolitan U)
1600 – 1620	Coffee break
1620 – 1720	Tien-Cuong Dinh (NUS)

Conference Dinner
- All speakers are invited
- Tuesday 30 August 2022
- Please assemble at 1730 in S17-05-11

Tuesday
30 August 2022

In-Person
NUS S17-05-11

via Zoom
Link: https://nus-sg.zoom.us/j/3910479411
Meeting ID: 892 1844 8494
Passcode: 709342

Titles & Abstracts

Speaker: Long Wang (U Tokyo)

Title: Numerical dimensions of Calabi-Yau varieties

Abstract: Lesieutre showed that different notions of numerical dimension for a pseudo-effective R-divisor do not coincide by studying a specific Calabi-Yau threefold. In this talk, I will discuss two numerical dimensions of Calabi-Yau varieties of higher dimension. This is a joint work with Chen Jiang.

Speaker: Ichiro Shimada (Hiroshima University)

Title: Mordell-Weil groups of a certain K3 surface

Abstract: We explain a method to calculate the action of Mordell-Weil groups of elliptic fibrations of a K3 surface on the N\'eron-Severi lattice of the K3 surface. Applying this algorithm, we present various constructions of the Leech lattice.

Speaker: Jia Jia (NUS)

Title: Automorphisms groups of compact complex surfaces

Abstract: I will discuss some properties of the automorphism groups of compact complex surfaces. We show that the torsion subgroup of the biholomorphic automorphisms group $\text{Aut}(X)$ is virtually nilpotent. Moreover, we study the Tits alternative of $\text{Aut}(X)$ and virtual derived length of virtually solvable subgroups of $\text{Aut}(X)$.

Titles & Abstracts

Speaker: Fabio Perroni (U Trieste)
Title: Cyclic and Abelian coverings of real varieties
Abstract: I will report on a joint work with Fabrizio Catanese and Micheal Loenne (University of Bayreuth) where we describe the birational and the biregular theory of cyclic coverings between real varieties. More precisely, for any real cyclic covering f: X \to Y, we first describe the extension of the real function field of Y by that of X, then we determine the data on Y which is needed to construct X and f.

Speaker: Yohsuke Matsuzawa (Rikkyo U/Osaka Metropolitan U)
Title: Height growth and Dynamical Lang-Siegel conjecture
Abstract: In the orbits of rational points by a self-morphism of a projective space, the sizes coordinates are expected to grow in the same speed. This phenomenon is called Dynamical Lang-Siegel conjecture (or maybe just a problem). Silverman solved this problem for self-morphisms on P^1 proving an estimate of local height functions, inspired by the technique that Siegel used to prove a theorem on sizes of coordinates of rational points on elliptic curves. I will be talking about this problem and related problems for higher dimensional algebraic varieties.

Titles & Abstracts

Speaker: Tien-Cuong Dinh (NUS)

Title: On the automorphisms of compact Kähler manifolds

Abstract: every automorphism group of a compact Kähler manifold satisfies Tits alternative: (1) either it admits a solvable subgroup of finite index, (2) or it contains a free group of two generators (Campana-Wang-Zhang). In the first case, we show that this group cannot be too big. We also study particular algebraic manifolds which allow us to show the existence of manifolds of any dimension (greater or equal to 2) with infinitely many non-equivalent real forms. This talk is based on my joint works with H.-Y. Lin, V.-A. Nguyen, K. Oguiso, N. Sibony, X. Yu, D.-Q. Zhang.