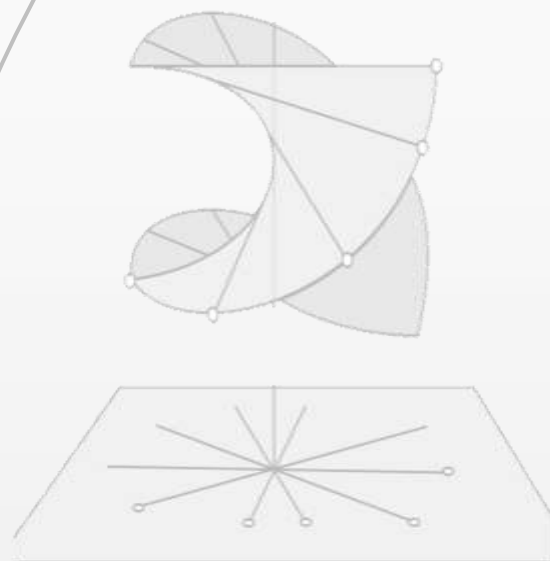




2024广州代数几何 研讨会

会议手册



$$y^2 = x^3 - x$$



2024 Guangzhou Algebraic Geometry Workshop

2024 广州代数几何研讨会

时间: 2024 年 6 月 1 日-6 月 2 日。5 月 31 日是接待日, 6 月 3 日是离会日。

地点: 广州市海珠区新港西路 135 号中山大学新数学楼 (266 栋) 415 教室

邀请报告人:

陈猛	复旦大学
杜荣	华东师范大学
江辰	复旦大学
江智	复旦大学
刘杰	中国科学院
孟晟	华东师范大学
欧文浩	中国科学院
孙笑涛	天津大学
余讯	天津大学
朱智贤	首都师范大学

组委会: 胡建勋 李长征 刘海东 宋雷

主办单位: 中山大学数学学院

注册: 会议没有注册费, 统一安排参会人员食宿。请于 5 月 22 日前扫描下方二维码完成注册。



I. 会议日程

日期	时间	报告嘉宾	主持人
06/01	09:00-10:00	陈猛	胡建勋
	10:00-10:30	合影、茶歇	
	10:30-11:30	杜荣	
	11:30-14:00	午餐	
	14:00-15:00	江智	梁永祺
	15:00-15:20	茶歇	
	15:20-16:20	刘杰	
	16:20-16:40	茶歇	
	16:40-17:40	孟晟	
	18:00	晚宴	
06/02	9:00-10:00	孙笑涛	张磊
	10:00-10:30	茶歇	
	10:30-11:30	欧文浩	
	11:30-14:00	午餐	
	14:00-15:00	江辰	吕鑫
	15:00-15:20	茶歇	
	15:20-16:20	余讯	
	16:20-16:40	茶歇	
	16:40-17:40	朱智贤	
	18:00	晚餐	

II. 报告题目与摘要

Title: Some new advances on birational geometry of varieties of general type

Speaker: 陈猛

Abstract: In this lecture, we introduce some new advances on induction and lifting property of canonical stability index of varieties of general type. The content covers my joint work with Zhi Jiang and Hexu Liu.

Title: Algebraic vector bundles on Grassmannians in positive characteristics

Speaker: 杜荣

Abstract: Algebraic vector bundles over projective spaces or even Grassmannians in positive characteristic exhibit notable distinctions from those in characteristic zero. In this talk, I will talk about several dissimilarities regarding this issue. This talk is based on the joint works with Xinyi Fang and Yuhang Zhou.

Title: An effective upper bound for anti-canonical volumes of singular Fano 3-folds

Speaker: 江辰

Abstract: Fano varieties are natural geometric objects in algebraic geometry and differential geometry. Motivated by the classifications theory, we are interested in certain boundedness properties of Fano varieties. In this talk, I will explain recent progress on the study of anti-canonical volumes of Fano 3-folds. We show that for a Fano 3-fold with e-lc singularities, the anti-canonical volume is at most $3200/e^4$. This is based on a joint work with Yu Zou.

Title: On Severi type inequalities and equalities

Speaker: 江智

Abstract: We will report a method initiated by Barja-Pardini-Stoppino to prove Severi type inequalities. By combining calculations of cohomological rank function, we can apply these inequalities to classify irregular varieties with small birational invariants.

Title: The algebra of symmetric tensors and symplectic geometry of cotangent bundles

Speaker: 刘杰

Abstract: The algebra of symmetric tensors of a projective manifold is a graded \mathbb{C} -algebra, which is canonically isomorphic to the ring of regular functions over the total space of the cotangent bundle. Despite its simple definition, this is an intriguing object and it is less studied in the literature. In this talk I will discuss it by some typical examples, focusing on its interaction with symplectic geometry of cotangent bundles.

Title: On dynamical Iitaka fibration

Speaker: 孟晟

Abstract: Dynamical Iitaka fibration is used to create a new equivariant fibration when the birational equivariant minimal model program fails. I shall mainly explain this technique in this talk. If we still have time, I shall further introduce a bit the applications. This talk is based on a joint work with De-Qi Zhang.

Title: Orbifold modification of complex analytic varieties

Speaker: 欧文浩

Abstract: We prove that if X is a compact complex analytic variety, which has quotient singularities in codimension 2, then there is a projective bimeromorphic morphism $f: Y \rightarrow X$, such that Y has quotient singularities, and that the indeterminacy locus of f^{-1} has codimension at least 3 in X . As an application, we deduce the Bogomolov-Gieseker inequality on orbifold Chern classes for stable reflexive coherent sheaves on compact Kaehler varieties which have quotient singularities in codimension 2.

Title: A finite dimensional proof of the Verlinde formula

Speaker: 孙笑涛

Abstract: A formula of dimensions for the spaces of generalized theta functions on moduli spaces of parabolic bundles on a curve of genus g , the so called Verlinde formula, was predicted by Rational Conformal Field Theories. The proof of Verlinde formula by identifying the spaces of generalized theta functions with the spaces of conformal blocks from physics was given in last century mainly by Beauville and Faltings (so called infinite dimensional proof). Under various conditions, many mathematicians tried to give proofs of Verlinde formula without using of conformal blocks, which are called finite dimensional proofs by Beauville. In this talk, we give unconditionally a purely algebro-geometric proof of Verlinde formula.

Our proof is based on two recurrence relations, one of which establishes an inductive procedure for the genus of curves, another one provides an inductive procedure for the number of parabolic points. This is a joint work with Mingshuo Zhou.

Title: K3 surface entropy and automorphism groups

Speaker: 余讯

Abstract: In this talk, we give a characterization of the complex projective K3 surfaces admitting automorphisms of positive entropy and we explain how to classify the projective K3 surfaces of zero entropy with infinite automorphism groups. As an application, we determine the projective K3 surfaces of Picard number at least five with almost abelian automorphism groups. This answers a question of Nikulin.

Title: Positivity of line bundles on toric varieties

Speaker: 朱智贤

Abstract: In this talk, we first characterize the jet ampleness of line bundles on a toric variety, in terms of the lattice length of their associated polytopes. As an application, we prove a k -jet generalization of Fujita's conjectures. Inspired by the Mukai conjecture, which naturally generalizes Fujita's conjectures, we make a conjecture regarding the higher syzygies in terms of the lattice length and report our progress in this conjecture. Part of the talks is based on joint work with Jose Gonzalez and joint work in progress with Lei Song and Huanqi Wen.

III. 住宿信息

中大凯丰酒店（中大学人馆）：

地址：广州市海珠区滨江东路 588 号中山大学北门

酒店联系电话：020-89222888

入住方式：报自己姓名，说 2024 广州代数几何研讨会预订即可。

会务联系人：

刘海东: 18810270821 邮箱: liuhd35@mail.sysu.edu.cn

宋雷:13122560475 邮箱: songlei3@mail.sysu.edu.cn

余金云: 15876504273 邮箱: yujinyun@mail.sysu.edu.cn

IV. 交通

从广州白云国际机场或广州各大火车站，均可乘坐地铁、出租车等交通工具前往中山大学南校区。如果乘坐地铁，终点站为 8 号线中大地铁站。如果乘坐出租车，鉴于酒店位置，推荐下车地址：中山大学南校区北门。

以下是从几大客运枢纽来校的推荐路线：

广州南站：

从广州南站可乘坐地铁 2 号线到昌岗地铁站，然后从昌岗站换乘地铁 8 号线到中大地铁站。从 A 出口出站，然后向东步行大约 500 米左右可到达学校南门。

广州白云国际机场：

乘坐地铁 3 号线到客村地铁站，然后换乘地铁 8 号线到中大地铁站。从 A 出口出站，然后向东步行约 500 米左右到达学校南门。

V. 校园地图



笔记

國立廣東大學成立之訓詞

博審慎明
篤篤
學問思辨
行行

中華民國十三年十二月

孫文

