

# 2023 北京-广州代数几何青年研讨会

## 一、日程安排

时间、日期	1.10	1.11	1.12
9:30-10:30	陈国度 (西湖大学)	胡勇 (上海交通大学)	徐政 (中科院)
10:45-11:45	陈伊凡 (北京航空航天大学)	江辰 (复旦大学)	周明铄 (天津大学)
2:00-3:00	顾怡 (苏州大学)	刘杰 (中科院)	
3:15-4:15	韩京俊 (复旦大学)	肖建 (清华大学)	

## 二、会务信息

主办单位：北京国际数学研究中心，中山大学数学学院

腾讯会议：925-2947-3529

密码：202301

会议联系人：田志宇、刘海东(18810270821)

### 三、报告信息

陈国度(西湖大学)

题目: On effective log Iitaka fibrations

摘要: We study the relationship between Iitaka fibrations and the conjecture on the boundedness of complements, assuming the good minimal model conjecture. We show the effective log Iitaka fibration conjecture for threefold pairs. This is an ongoing joint work with Jingjun Han and Jihao Liu.

陈伊凡(北京航空航天大学)

题目: Commuting involutions on surfaces of general type with geometric genus zero and Bloch conjecture

摘要: A complete classification of complex smooth surfaces of general type with geometric genus zero is still missing. Many examples of such surfaces have commuting involutions. I will talk about the classification of pairs  $(S, G)$ , where  $S$  is a smooth minimal complex surface of general type with  $p_g = 0$  and  $K^2 = 7$ ,  $G$  is a subgroup of  $Aut(S)$  and  $G$  is isomorphic to the Klein group. I also discuss Bloch conjecture for such surfaces.

顾怡(苏州大学)

题目: Surfaces on the Severi line in positive characteristic

摘要: Let  $X$  be a minimal surface of general type with maximal Albanese dimension. It is proved by Pardini in characteristic zero and by Yuan-Zhang in positive characteristic that the following inequality:  $K_X^2 \geq 4\chi$  holds. We say  $X$  is on the Severi line if the equality holds. In characteristic zero, a classification of surfaces on the Severi line is given by Barja-Pardini-Stoppino and Lu-Zuo independently. In this talk, we will present a classification of surface on the Severi line in positive characteristic. This is a joint work with professor X. Sun and M. Zhou.

韩京俊(复旦大学)

题目: On termination of flips and exceptionally non-canonical singularities

摘要: In this talk, I will introduce the so-called "exceptionally non-canonical singularities". Although being noncanonical, such pairs are expected to have nice properties. In particular, it is predicted that the set of minimal log discrepancies (mlds) of exceptional non-canonical pairs should satisfy the ascending chain condition (ACC). I will show the relationship of this conjecture with the termination of flips, and the conjecture holds in dimension 3.

## 胡勇(上海交通大学)

**题目:** Relative Severi inequality for fibrations of maximal Albanese dimension over curves

**摘要:** Let  $f: X \rightarrow B$  be a relatively minimal fibration of maximal Albanese dimension from a variety  $X$  of dimension  $n \geq 2$  to a curve  $B$  defined over an algebraically closed field of characteristic zero. We prove that  $K_{X/B}^n \geq 2n! \chi_f$ . It verifies a conjectural formulation of Barja and it also leads to a new proof of the Severi inequality for varieties of maximal Albanese dimension. Moreover, when the equality holds and  $\chi_f > 0$ , we prove that the general fiber  $F$  of  $f$  has to satisfy the Severi equality that  $K_F^{n-1} = 2(n-1)! \chi(F, \Omega_F)$ . We will present some sharper results of the same type under extra assumptions if time permits. This is a joint work with Tong Zhang.

## 江辰(复旦大学)

**题目:** An upper bound for polynomial log-volume growth of automorphisms of zero entropy

**摘要:** For an automorphism  $f$  of a smooth projective variety  $X$ , Gromov introduced the log-volume growth of  $f$  and showed that it coincides with the algebraic/topological entropy of  $f$ . In order to study automorphisms of zero entropy, Cantat and Paris-Romaskevich introduced polynomial log-volume growth of  $f$  (*plov* for short) which turns out to be closely related to the Gelfand-Kirillov dimension of the twisted homogeneous coordinate ring associated with  $(X, f)$ . We show an optimal upper bound that  $plov(f)$  is at most  $d^2$ , where  $d$  is the dimension of  $X$ . This affirmatively answers questions of Cantat-Paris-Romaskevich and Lin-Oguiso-Zhang. This is joint work with Fei Hu.

## 刘杰(中科院)

**题目:** Regular functions over cotangent bundles of Fano manifolds

**摘要:** Let  $X$  be a Fano manifold. The ring  $R$  of regular functions over the cotangent bundle of  $X$  is canonically isomorphic to the graded ring of symmetric vector fields on  $X$ . This ring  $R$  appears naturally in several special cases and it has been intensively studied there. However, it is still less understood in the general case. In this talk, I will explain some interesting examples and introduce our recent works which aim to find out these  $X$  which have large  $R$ .

## 肖建(清华大学)

**题目:** TBD

**摘要:** TBD

## 徐政(中科院)

**题目:** On the 3-dimensional lc abundance in positive characteristic

**摘要:** Over the last decade, the Minimal Model Program (MMP) for threefolds over a field of characteristic  $> 3$  has been largely established. A central problem remained is the log abundance conjecture. There are many results on the log abundance for klt threefold pairs in characteristic  $> 5$ . In this talk, we explain how to generalize these results to lc threefold pairs in characteristic  $> 3$ . For example, we prove that over an algebraically closed field of characteristic  $> 3$ , the log abundance for klt threefold pairs implies the log abundance for lc threefold pairs.

## 周明铄(天津大学)

**题目:** Moduli space of parabolic bundles over a curve

**摘要:** We firstly recall the degeneration argument of moduli space for Verlinde formula, and then, use above technique to prove F-splitting of moduli space of parabolic bundles (for generic curve and generic parabolic points). This is a joint work with Professor Xiaotao Sun.