

Workshop on K-theory and arithmetic

时间与地点:

2026年1月30日至2月2日

长沙亚朵酒店省府店二楼会议厅

主办单位:

湖南大学数学学院, 湘潭大学数学与计算科学学院

报告人:

曹晋(北京科技大学)
程家豪(南昌航空大学)
胡文传(四川大学)
胡晓文(大湾区大学)
罗马(华东师范大学)
谢恒(中山大学)
薛江维(武汉大学)
张磊(中山大学珠海)
赵和耳(哈尔滨工业大学)

日程安排:

1月30日: 报到

1月31日:

时间	标题	报告人
9:00-12:00	自由讨论	
15:00-15:45	Topological method in algebraic cycle theory	胡文传
15:45-16:30	Trace method and algebraic K-theory over truncated Witt vectors	胡晓文
16:30-17:00	茶歇	
17:00-17:45	Relative completions of mapping class groups	罗马

2月1日:

时间	标题	报告人
9:00-9:45	Counting superspecial points on Shimura curves	薛江维

9:45-10:30	Brown's geometric proof of Borel's theorem on stable cohomology of $GL_g(\mathbb{Z})/SL_g(\mathbb{Z})$	曹晋
10:30-11:00	茶歇	
11:00-11:45	Brace B infinity algebras associated with Hopf algebroids	程家豪
12:00-14:00	午餐	
14:00-14:45	The Serre-Tate theorem for Log Abelian Varieties	赵和耳
14:45-15:30	Witt groups of quadrics with twisted line bundles	谢恒
15:30-16:00	茶歇	
16:00-16:45	Local systems in characteristic p	张磊

2月2日：离会

联系人：

孙鹏(sunpeng@xtu.edu.cn)，熊玮

资助项目：

国家重点研发计划(项目号：2021YFA1001400)

题目和摘要：

报告人：胡文传(四川大学)

题目：Topological method in algebraic cycle theory

摘要：We intend to explore the applications of techniques from algebraic topology within the framework of algebraic cycle theory, with a particular focus on the structural properties of Chow groups and Lawson homology.

报告人：胡晓文(大湾区大学)

题目：Trace method and algebraic K-theory over truncated Witt vectors

摘要：This is a continuation of my previous talk in a workshop in Beijing and is still based on arXiv: 2507.12458, which shows that the relative algebraic K-theory of a p-adic infinitesimal deformation is related to a de Rham-like cohomology. After a brief account of the trace method in algebraic K-theory, we will discuss several key points in the proof with more details, and propose several problems.

报告人：罗马(华东师范大学)

题目：Relative completions of mapping class groups

摘要：I will discuss structural presentations for relative completions of mapping class

groups. In higher genus cases with genus at least 3, presentations are known, and will be reviewed first. The genus 2 case is unknown, but we provide a partial solution. In this case, the generators are related to Collino cycles. This is a direct analogue of higher genus cases where generators are related to Ceresa cycles. As for relations, we provide evidence to generate them via arithmetic considerations, while in higher genus cases, relations are quite topological. This is joint work with Tatsunari Watanabe.

报告人: 薛江维(武汉大学)

题目: Counting superspecial points on Shimura curves

摘要: Let B be an indefinite quaternion \mathbb{Q} -algebra, and O be a maximal order in B . As a coarse moduli space, the Shimura curve X_B parametrizes abelian surfaces (A, ι) with O -multiplication satisfying the Kottwitz determinant condition. We compute the number of irreducible components and the superspecial points in the bad reduction case. This talk is based on joint work in progress with Yasuhiro Terakado and Chia-Fu Yu.

报告人: 曹晋(北京科技大学)

题目: Brown's geometric proof of Borel's theorem on stable cohomology of $GL_g(\mathbb{Z})/SL_g(\mathbb{Z})$

摘要: This talk will survey Brown's recent work proving Borel's celebrated results on the stable cohomology of $GL_g(\mathbb{Z})/SL_g(\mathbb{Z})$.

报告人: 程家豪(南昌航空大学)

题目: Brace B infinity algebras associated with Hopf algebroids

摘要: In this talk, we apply the operadic modeling of brace B infinity algebras, as developed by Gerstenhaber and Voronov, to the context of Hopf algebroids in the sense of Xu. As an application of this framework, we examine two specific brace B infinity algebras derived from Lie algebra pairs, and reveal previously obscured relationships between them. One of these is the brace B infinity algebra governing deformations of algebraic dynamical twists, while the other arises from quantum groupoid comprised of particular invariant differential operators. This is a joint work with Zhuo Chen and Yu Qiao.

报告人: 赵和耳(哈尔滨工业大学)

题目: The Serre-Tate theorem for Log Abelian Varieties

摘要: For abelian schemes, the Serre-Tate theorem says that the infinitesimal deformations of an abelian scheme are determined by the infinitesimal deformations of its p -divisible groups. In Drinfeld's proof of Serre-Tate theorem, Messing's theorem on the formal smoothness of p -divisible groups plays an important role. In this talk, we discuss the analogues of the two theorems for log abelian varieties and log p -divisible groups.

报告人: 谢恒(中山大学)

题目: Witt groups of quadrics with twisted line bundles

摘要: In 1937, Ernst Witt introduced a group structure on the set of isometry classes of anisotropic quadratic forms over an arbitrary field. This object is now known as the Witt groups. Computing this group structure is equivalent to classifying isomorphism classes of quadratic forms. In 1977, Knebusch generalized this construction to algebraic schemes.

In this talk, we will show that the Witt groups of quadric hypersurfaces fit into long exact sequences relating them to the base ring and to Clifford algebras equipped with various duality coefficients. All shifts and twists are taken into account.

报告人: 张磊(中山大学珠海)

题目: Local systems in characteristic p

摘要: Let X be a normal scheme of characteristic $p > 0$, and let U be a dense open. We will show that the restriction of a local system on X to U is a fully faithful observable functor. Consequently, the induced map on the Tannakian gerbes is a quotient map. As an application, we show that a normal proper simply connected scheme X of characteristic $p > 0$ admits no nontrivial local systems. This was previously known by Esnault-Mehta for X smooth projective. This is a joint work with Adrian Langer.