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会议议程 Agenda

	周一 7/18		周二 7/19	周三 7/20	周四 7/21	周五 7/22
9:00-9:10	李骏(致辞)	9:00-10:00	许晨阳	饶胜	谢俊逸	朱智贤
9:10-10:10	阮勇斌					
 合照环节			 茶歇			
10:25-11:25	Caucher Birkar	10:15-11:15	谈胜利	刘杰	周杨	韩京俊
午餐休息						
14:00-15:00	刘永强	14:00-15:00	周明铄	欧文浩	博士后/博士 报告	胡勇
 茶歇						
15:15-16:15	魏传豪	15:15-16:15	孙浩	顾怡		李展
 茶歇						
16:30-17:30		16:30-17:30	Will Donovan			

	Monday 7/18		Tuesday 7/19	Wednesday 7/20	Thursday 7/21	Friday 7/22
9:00-9:10	Jun Li (Opening Speech)	9:00-10:00	Chenyang Xu	Sheng Rao	Junyi Xie	Zhixian Zhu
9:10-10:10	Yongbin Ruan					
 Photo			 Coffee Break			
10:25-11:25	Caucher Birkar	10:15-11:15	Shengli Tan	Jie Liu	Yang Zhou	Jingjun Han
Lunch & Break						
14:00-15:00	Yongqiang Liu	14:00-15:00	Mingshuo Zhou	Wenhao Ou	Postdoc/PhD Session	Yong Hu
 Coffee Break						
15:15-16:15	Chuanhao Wei	15:15-16:15	Hao Sun	Yi Gu		Zhan Li
 Coffee Break						
16:30-17:30		16:30-17:30	Will Donovan			

博士后/博士报告

Postdoc/PhD Session

13:00-13:30	舒成 (Cheng Shu)
13:35-14:05	吕人杰 (Renjie Lv)
14:10-14:30	郭函菲 (Hanfei Guo)
14:35-14:55	张儒轩 (Ruxuan Zhang)
15:00-15:20	邹瑜 (Yu Zou)
15:25-15:45	杜佳宾 (Jiabin Du)
15:50-16:20	汪建平 (Jianping Wang)
16:25-16:45	林小进 (Xiaojin Lin)
16:50-17:10	周琳 (Lin Zhou)

报告内容

Title & Abstract

报告人：阮勇斌，浙江大学

Speaker: Yongbin Ruan, Zhejiang University

题目：对数R映射

Title: Logarithmic R-map

摘要：以Kahler流形或辛流形为目标的稳定映射是来自Gromov-Witten理论中的一个基本概念。在物理中的LGA模型中，目标对象上会带有一个附加的 C^* -作用，被称作是R-荷。它转变了在所谓的规范线性 σ -模型中的映射的概念。此外，即使有稳定条件，其模空间也是非紧的。这次报告中我们将介绍所谓“R-映射”的概念，在紧化它的过程中会导出对数R-映射理论。这项工作是与Qile Chen和Felix Janda合作完成的。

Abstract: The fundamental object of Gromov-Witten theory is the notation of stable map to a target Kahler/Symplectic manifold. In LG A-model in physics, the target carries an additional C^* action called R-charge. It twisted the notation of map in so called gauged linear sigma model. Furthermore, its moduli space is noncompact even with stability condition. In the talk, we will introduce the notation of R-map. The effort to compactify it leads to the theory of Logarithmic R-maps. This is a joint work with Qile Chen and Felix Janda.

报告人：Caucher Birkar，清华大学

Speaker: Caucher Birkar, Tsinghua University

题目：Calabi-Yau纤维空间的几何

Title: Geometry of Calabi-Yau fibre spaces

摘要：在代数簇的分类体系中，Calabi-Yau纤维化是一个自然的概念，并且起到了重要作用。许多代数簇的双有理等价对象上存在这样的纤维化，因此非常有必要了解这类结构。在这次的报告中我会叙述这个方向的一些最近的结果。

Abstract: In the classification scheme of algebraic varieties, Calabi-Yau fibrations appear naturally and they play a key role. A large class of varieties admits such a fibration birationally. So it is vital to understand such structures. In this talk I will describe some recent results in this direction.

报告人：刘永强，中国科学技术大学

Speaker: Yongqiang Liu, University of Science and Technology of China

题目：光滑复拟射影簇上的 L^2 -型不变量和上同调突变位点

Title: L^2 -type invariants and cohomology jump loci for smooth complex quasi-projective varieties

摘要：设 X 是光滑的复拟射影簇，并固定了一个满射 $v: \pi^{-1}(X) \rightarrow Z$ 。我们考虑诸如Betti数以及 v 相关的奇异同调群挠子群的阶，即 L^2 型不变量的渐近性质。对于1次的情形，我们会给出通过 X 的几何信息去计算这些不变量的具体公式。证明中要用到上同调突变位点理论。作为其应用，当 X 是超平面组的补时，我们给出复系数上同调突变位点中正维数的平行分支的个数的组合上界。这项工作是和Fengling Li合作完成的。

Abstract: Let X be a smooth complex quasi-projective variety with a fixed epimorphism $v: \pi^{-1}(X) \rightarrow Z$. We consider the asymptotic behavior of invariants such as Betti numbers and the order of the torsion subgroup of singular homology associated to v , known as the L^2 -type invariants. For degree 1, we give concrete formulas to compute these invariants by geometric information of X . The proof relies on the theory of cohomology jump loci. As an application, when X is a hyperplane arrangement complement, a combinatorial upper bound is given for the number of parallel positive dimension components in degree 1 cohomology jump loci with complex coefficients. Joint work with Fengling Li.

报告人：魏传豪，西湖大学

Speaker: Chuanhao Wei, Westlake University

题目：通过非交换霍奇理论研究Kodaira类消失定理

Title: Kodaira-type vanishings via Nonabelian Hodge Theory

摘要：在过去的十年内，Mochizuki完成了宏大的混合扭曲 D 模的理论。在这个讲座中，我将先简单地介绍这一结果。然后，我将展示Kodaira类消失定理在混合扭曲 D 模的结构下依然成立，作为在混合霍奇模中Saito消失定理的推广。之后我还会介绍一个相对的版本和一个用 Q -除子的Kawamata-Viehweg消失定理的版本。这两个推广版本，即使在混合霍奇模的意义下，目前看来也是新的结果。

Abstract: In the past decade, Mochizuki has completed the spectacular theory of mixed Twistor D -modules. In this talk, I will first briefly introduce this result. Then, I will show that Kodaira-type vanishing still holds under the setting of mixed Twistor D -modules, which generalizes Saito vanishing under the setting of mixed Hodge Modules. I will also introduce a relative version and a version of Kawamata-Viehweg vanishing with Q -divisors, under this general setting. Both of them seem to be new even in the mixed Hodge Modules setting.

报告人：许晨阳，北京大学/普林斯顿大学

Speaker: Chenyang Xu, Peking University & Princeton University

题目：高秩有限生成性与K-稳定性

Title: Higher rank finite generation and K-stability

摘要: 在Fano簇的K-稳定性的研究中产生的一个关键问题是用来计算稳定性阈值的赋值的相伴分次环的有限生成性。事实上，它既与K-ps的Fano簇的模空间的紧化有密切联系，也和代数Yau-Tian-Donaldson猜想有关。当赋值是除子型时，有限生成性可从极小模型纲领中的一些基本结果推出；对于有理秩比较高的赋值，证明这件事则需要大量新的想法。我们将讨论围绕这类新的有限生成结果所产生的各种想法，以及它对完善K稳定性理论中主要问题的解决所产生的影响。

Abstract: A key question raised in the study of K-stability of Fano varieties is the finite generation of the associated graded ring for valuations computing its stability threshold. In fact, it is closely related to the compactness of the moduli space parametrizing K-polystable Fano varieties, as well as the algebraic Yau-Tian-Donaldson Conjecture. While when the valuation is divisorial, the finite generation follows from standard minimal model program results; for valuations with higher rational ranks, proving it needs substantially new ideas. We will discuss the circle of ideas developed around this new type of finite generation result, and its consequences on completing the solutions of major problems in K-stability theory.

报告人：谈胜利，华东师范大学

Speaker: Shengli Tan, East China Normal University

题目：纤维化的模不变量与微分方程的双有理不变量

Title: Modular invariant of fibrations and birational invariant of differential equations

摘要: 十九世纪时，庞加莱、潘勒维等数学家就注意到参数化代数曲线（一束代数曲线）是某一阶常微分方程的解析解，因此他们建议利用复代数几何的方法研究微分方程。具体来说，就是研究参数曲线的那些拓扑性质可以推广到微分方程。最近三十多年来，该问题重新引起了人们的注意，代数曲线束的理论被逐步推广到微分方程，比如，纤维化的正规交极小模型，模小平维数，模不变量等。本演讲将介绍这一方面的研究进展。

Abstract: In the 19th century, mathematicians such as Poincare and Penlevi noticed that parametric algebraic curves (a pencil of algebraic curves) were analytical solutions to an ordinary differential equation of a certain order, so they suggested the use of complex algebraic geometry to study differential equations. In particular, find the topological properties of algebraic curves that can be generalized to differential equation. In recent 30 years, this problem has attracted people's attention again, and the theory of algebraic curve bundles has been gradually extended to differential equations, such as the fibration normal intersection minimal model, modular Kodaira

dimensions, modular invariant and so on. This talk will introduce the research progress in this area.

报告人：周明铄，天津大学

Speaker: Mingshuo Zhou, Tianjin University

题目：曲线上抛物向量丛的模空间

Title: Moduli space of parabolic bundles on a curve

摘要：首先，我们简要回顾如何运用曲线上抛物向量丛模空间的退化(Narasimhan-Ramadas-Sun方法)来证明Verlinde公式。然后，我们将说明退化方法也适用于证明正特征情形模空间（关于一般选取的曲线和抛物点）的F-分裂性质。这是和孙笑涛教授合作的工作。

Abstract: In this talk, we will review a program (by Narasimhan-Ramadas and Sun) on the proof of Verlinde formula by using degeneration of moduli spaces of parabolic bundles on curves. We will also show how the degeneration argument can be used to prove F-splitting of moduli space of parabolic bundles (for generic choice of parabolic points) on a generic curve in positive characteristic. This is a joint work with Professor Xiaotao Sun.

报告人：孙浩，上海师范大学

Speaker: Hao Sun, Shanghai Normal University

题目：三维簇纤维化上的Bridgeland 稳定条件

Title: Bridgeland stability conditions on fibred threefolds

摘要：自从Bridgeland于2007年提出三角范畴上的稳定条件之后，这一概念立刻引起了人们的极大兴趣和关注。三维簇上稳定条件的存在性问题一般被认为是这一领域内最大的公开问题。Bayer-Macri-Toda于2014年提出了在三维簇上构造稳定条件的一个猜想性的途径。这里问题被归结为证明关于某种稳定复形第三陈省身类的Bogomolov-Gieseker型不等式。这个不等式在Fano三维簇、abel三维簇、5次超曲面等三维簇上都得到了验证。在本次报告中，报告人将在带纤维化的三维簇上给出稳定条件的一个猜想性的构造。这个构造同样依赖于关于某种稳定复形第三陈省身类的Bogomolov-Gieseker型不等式。我们证明这个不等式对于直纹三维簇成立，并由此导出一类强Bogomolov型不等式。如果时间允许，我们还将讨论Bogomolov-Gieseker型不等式在Fujita猜想和曲线计数等问题中的应用

Abstract: Since Bridgeland's introduction in 2007, stability conditions for triangulated categories have drawn a lot of attentions, and have been investigated intensively. The existence of stability conditions on threefolds is often considered the biggest open problem in the theory of Bridgeland stability conditions. In 2014, Bayer, Macri and Toda introduced a conjectural construction of Bridgeland stability

conditions for any projective threefold. Here the problem was reduced to proving a Bogomolov-Gieseker type inequality for the third Chern character of tilt-stable objects. It has been shown to hold for Fano 3-folds, abelian 3-folds, quintic threefolds, etc. In this talk, we will give a conjectural construction of stability conditions on the derived category of fibred threefolds. The construction also depends on a conjectural Bogomolov-Gieseker type inequality for certain stable complexes. We prove the conjectural Bogomolov-Gieseker type inequalities for ruled threefolds. It gives a type of strong Bogomolov inequality. If time permits, we will discuss the applications of Bogomolov-Gieseker type inequalities to Fujita's conjecture and curve counting theory.

报告人: Will Donovan, 清华大学

Speaker: Will Donovan, Tsinghua University

题目: Calabi-Yau中的单形

Title: Simplices in the Calabi-Yau web

摘要: 给定维数下的Calabi-Yau流形是被一个由双有理映射构成的复杂网络联系起来的, 后者可从镜像对称的观点进行研究。我将重点关注4维及以上的一系列奇点, 每个奇点都由一个具有特定符号的秩为1的张量锥给出。这些奇点存在自然地对应着单形的顶点的解消, 并揭示了4维及以上出现的新结构。

Abstract: Calabi-Yau manifolds of a given dimension are connected by an intricate web of birational maps, which can be studied from the viewpoint of mirror symmetry. I will focus on a sequence of singularities in dimension 4 and above, each given by a cone of rank 1 tensors of a certain signature. These have resolutions naturally corresponding to vertices of a simplex, and illustrate new structures that arise for 4-folds and beyond.

报告人: 饶胜, 武汉大学

Speaker: Sheng Rao, Wuhan University

题目: Moishezon簇的形变极限和多亏格不变性

Title: Deformation limit and invariance of plurigenera of Moishezon varieties

摘要: 本次报告主要探讨Moishezon簇形变的两个课题。第一个是一个长期公开的猜想: 射影或Moishezon流形的光滑形变极限是Moishezon。我们将在极限纤维满足很弱的条件下证明此猜想。第二个是多亏格的变形不变性, 特别考虑了Demilly的一个问题: 一个非奇异射影簇的光滑族是否满足多亏格形变不变性。我们对更广的遍纤维Moishezon光滑族肯定回答了这一问题, 同时还证明了一个平坦族的情形。本次报告主要基于与蔡宜洵、李毅的三篇合作论文。

Abstract: This talk mainly concerns two topics on the deformations of Moishezon varieties. The first one is a long-standing conjecture that the smooth deformation limit

of projective or Moishezon manifolds is Moishezon. We will prove this conjecture under some mild condition on the limit fiber. The second one is deformation invariance of plurigenera, particularly on a question of Demailly whether a smooth family of nonsingular projective varieties admits the deformation invariance of plurigenera. We confirm this more generally for a smooth fiberwise Moishezon family, and also prove a flat family case. This talk is mainly based on three joint works with I-Hsun Tsai and Yi Li.

报告人：刘杰，中国科学院

Speaker: Jie Liu, Chinese Academy of Sciences

题目：Fano叶状结构的代数秩的下界

Title: Bounding algebraic ranks of Fano foliations

摘要：在研究代数簇上的全纯叶状结构时，其核心问题之一就是寻找适当的条件来确保该叶状结构的叶片均为代数子簇。为此，人们引入了叶状结构的代数秩这一概念来测量一个叶状结构的叶片的代数性。另一方面，数学家此前已经对具有较大指标或者较大Seshadri常数的Fano簇的精细分类进行了大量探讨与研究。受此启发，我将讨论如何使用与叶状结构的反典范除子的正性相关的整体或者局部不变量给出Fano叶状结构的代数秩的最优下界。

Abstract: One of the central problems in the theory of foliations is to find conditions that guarantee the existence of algebraic leaves and the notion of algebraic rank is introduced to measure the algebraicity of leaves of a foliation. Inspired by the previous works on the classification of Fano varieties with large indices or large Seshadri constants, I will discuss how to use global or local invariants related to the positivity of the anti-canonical divisor of a Fano foliation to give a sharp lower bound of its algebraic rank.

报告人：欧文浩，中国科学院

Speaker: Wenhao Ou, Chinese Academy of Sciences

题目：切丛带有正性的射影代数簇

Title: Projective varieties whose tangent bundle contains certain positivity

摘要：此报告围绕具有带正性子切丛的射影代数簇展开。我们将概述近来的一系列相关工作。

Abstract: In this talk, we survey our recent works on projective varieties whose tangent bundle contains a positive subsheaf.

报告人：顾怡，苏州大学

Speaker: Yi Gu, Suzhou University

题目：Fujita猜想在正特征中的反例

Title: Counterexamples to Fujita's conjecture in positive characteristic

摘要：设 X 是定义在复数域上的 d 维光滑射影簇， A 是其上的一个丰沛除子。在1987年，Fujita曾猜想 $K+nA$ 在 $nd+1$ 时无基点，在 $nd+2$ 时极丰沛。我们会证明此猜想在正特征下是错的。更具体的讲，对于任何正特征的代数闭域以及任何整数 m ，我们要证明存在曲面 X 以及一个丰沛除子，使得 $K+mA$ 无基点。这项工作是与Lei Zhang以及Yongming Zhang合作完成的。

Abstract: Let X be a smooth projective variety of dimension d over field of complex numbers and A be an ample divisor on it. In 1987, Fujita conjectured that $K+nA$ is free of base points if $nd+1$ and very ample if $nd+2$. We will show this conjecture fails in positive characteristic. More precisely, for any algebraically closed field of positive characteristic and any integer m , we show there is a surface X along with an ample divisor A such that $K+mA$ is not free of base points. This is a joint work with Lei Zhang and Yongming Zhang.

报告人：谢俊逸，北京大学**Speaker:**

Junyi Xie, Peking University

题目：复动力系统中的刚性定理

Title: Rigidity theorems in complex dynamics

摘要：与冀诸超合作，最近我们证明以及重新证明了复动力系统中的一些刚性定理。我们的证明结合了来自复动力系统，非阿动力系统和代数几何的想法。McMullen的刚性定理声称，在flexible Lattès映射之外，在周期点上的有相同乘数谱的有理函数等价类只有有限个。这是复动力系统中的重要结论。其原始证明依赖于Thurston关于PCF映射著名的刚性定理。而这一定理是Thurston通过Teichmüller理论证明的。我们给出了McMullen与Thurston刚性定理新的证明。我们的证明不依赖Teichmüller理论或拟共形映射的理论。进一步，我们证明将McMullen刚性定理中的乘数谱减弱为长度谱后其陈述仍然成立。以上结果均基于我们发现的关于例外有理函数的新判别法。应用此方法我们还证明了带标注长度谱和乘子谱的刚性，简化了Zdunik关于Hausdorff测度的刚性定理，以及证明了两个Milnor的猜想。

Abstract: With Zhuchao Ji, we have recently proved and reproved some rigidity theorems in complex dynamics. Our proof combines ideas from complex dynamics, non-archimedean dynamics, and algebraic geometry.

A remarkable theorem due to McMullen asserts that, aside from the flexible Lattès family, the multiplier spectrum of periodic points determines the conjugacy class of rational maps up to finitely many choices. The proof relies on Thurston's rigidity

theorem for PCF maps, in where Teichmüller theory is an essential tool. We will give a new proof of McMullen's theorem without using quasiconformal maps or Teichmüller theory. The above results are based on two new criteria we proved for the rational function to be exceptional. Applying them, we also proved the rigidity of the marked length and multiplier spectrums, simplified the proof of Zdunik's rigidity theorem for Hausdorff measures, and proved the two conjectures of Milnor.

报告人：周杨，复旦大学

Speaker: Yang Zhou, Fudan University

题目：K-理论拟映射穿公式及其应用

Title: K-theoretic quasimap wall-crossing and applications

摘要： K-理论Gromov-Witten不变量使用K-理论作为相交理论来虚拟地计算光滑射影流形或者轨形中的代数曲线的数目，近来因其与3D规范理论以及表示论的联系而受到重视。对很大一类GIT商空间，将Gromov-Witten理论的构造中的稳定映射紧化，换成epsilon稳定拟映射紧化，便得到拟映射不变量。当稳定性参数epsilon变化时，这些不变量会有穿墙现象；当epsilon趋于无穷时，又回到Gromov-Witten不变量。在本次报告中，我会讨论K理论拟映射不变量的穿墙公式与其应用。它类似于同调版本的穿墙公式，但因K-理论对有限群作用更加敏感，K-理论的置换等变性以及空间的一些轨形结构会带来新的现象。本报告涉及到的工作均与张铭合作完成。

Abstract: The K-theoretic Gromov-Witten invariants virtually count algebraic curves in smooth projective manifolds or orbifolds, using K-theory as an intersection theory. They are interesting due to their connections to 3d gauge theories and representation theory. For a large class of GIT quotients, the quasimap invariants are analogous to the Gromov-Witten invariants, defined using the moduli of epsilon-stable quasimaps as an alternative compactification of the space of maps from smooth domain curves. As epsilon varies, there is a wall-crossing phenomenon, and recovering the Gromov-Witten theory as epsilon tends to infinity. In this talk, I will talk about the quasimap wall-crossing of K-theoretic Gromov-Witten invariants and its applications. It is similar to the quasimap wall-crossing for cohomological Gromov-Witten invariants, but the permutation-equivariant structure and some orbifold subtleties lead to interesting new phenomena for the K-theoretic invariants. This is a joint work with Ming Zhang.

报告人：朱智贤，首都师范大学

Speaker: Zhixian Zhu, Capital Normal University

题目：Toric簇上的k-jet丰富线丛

Title: k -jet ampleness of line bundles on toric variety

摘要：给定一个线丛，通过整体截面空间对于高阶切向量的不同分离性可以定义k-jet丰富性质。此性质是线丛的整体生成性质和非常丰富性质的一个自然推广。在与Jose Gonzalez合作的工作中，我们在具备任意奇点的射影Toric簇上给出了多个与线丛的Seshadri常数、和群作用不变曲线的最小相交数等不变量相关的k-jet丰富性质的等价判别法，并由此在Toric簇上给出了Fujita猜想关于k-jet丰富性质的推广。

Abstract: k -jet ampleness of line bundles generalizes globally generation and very ampleness by existence of enough global sections to separate higher order analogues of tangent vectors. We give some sharp bounds guaranteeing that a line bundle on a projective toric variety, in terms of its intersection numbers with the invariant curves and its Seshadri constants. As an application, we prove the k -jet generalizations of Fujita's conjectures on toric varieties with arbitrary singularities. This is a joint work with Jose Gonzalez.

报告人：韩京俊，复旦大学

Speaker: Jingjun Han, Fudan University

题目：异常非正则对的最小对数差异的ACC猜想

Title: On ACC for minimal log discrepancies for exceptionally non-canonical pairs

摘要：我们将flip的终止性归结为terminal flip的终止性，以及异常非正则对的最小对数差异的ACC猜想。特别地，ACC猜想暗示了四维flip的终止性。我们还证明ACC猜想在三维中成立。这是我与Liu Jihao正在进行的合作。

Abstract: We reduce the termination of flips to the termination of terminal flips and the ACC conjecture for minimal log discrepancies for exceptionally non-canonical pairs. In particular, the ACC conjecture implies the termination of flips in dimension four. We also show the ACC conjecture holds in dimension three. This is an ongoing joint work with Jihao Liu.

报告人：胡勇，上海交通大学

Speaker: Yong Hu, Shanghai Jiaotong University

题目：小体积一般型三维代数簇

Title: Algebraic threefolds of general type with small volume

摘要：目前已知最优的Noether不等式 $\text{vol}(X) \geq \frac{4}{3} p_g(X) - \frac{10}{3}$ 对所有满足 $p_g(X) \geq 11$ 的一般型三维簇 X 都成立。在这篇文章中，我们通过给出 X 的相对典范模型的具体结构给出了 $p_g(X) \geq 11$ 并且满足上述等式的一般型三维簇 X 的完整分类。当 $p_g(X) \geq 23$ 时，该模型与典范模型 XX 一致。我们还对 $p_g(X) \geq 11$ 的一般型三维簇 XX 建立了第二和第三个最优Noether不等式。这些结果回答了由J. Chen, M. Chen和C. Jiang提出的两个开放问题，以及在三维中由J. Chen和C. Lai提出的一个开放问题。一个新的现象表明，三个Noether不等式与 $p_g(X) \pmod{3}$ 的三个余数之间存在一一对应关系。这是与Tong Zhang合作的作品。

Abstract: It is known that the optimal Noether inequality $\text{vol}(X) \geq \frac{4}{3} p_g(X) - \frac{10}{3}$ holds for every 3-fold XX of general type with $p_g(X) \geq 11$. In this paper, we give a complete classification of 3-folds XX of general type with $p_g(X) \geq 11$ satisfying the above equality by giving the explicit structure of a relative canonical model of XX . This model coincides with the canonical model of XX when $p_g(X) \geq 23$. We also establish the second and third optimal Noether inequalities for 3-folds XX of general type with $p_g(X) \geq 11$. These results answer two open questions raised by J. Chen, M. Chen and C. Jiang, and in dimension three an open question raised by J. Chen and C. Lai. A novel phenomenon shows that there is a one-to-one correspondence between the three Noether inequalities and three possible residues of $p_g(X) \pmod{3}$. This is a joint work with Tong Zhang.

报告人：李展，南方科技大学

Speaker: Zhan Li, Southern University of Science and Technology

题目：Calabi-Yau 纤维空间的 Morrison-Kawamata 锥猜想

Title: Morrison-Kawamata cone conjecture for Calabi-Yau fiber spaces

摘要：本报告将解释关于 Calabi-Yau 纤维空间的 Morrison-Kawamata 锥猜想与 Shokurov 多面体存在性之间的关系。对于 K3 曲面纤维化，这种关系可以用来得到关于 movable 锥的（弱）基本区域。本报告基于与赵航的合作工作。

Abstract: In this talk, I will explain the relationship between the Morrison-Kawamata cone conjecture for Calabi-Yau fiber spaces and the existence of Shokurov polytopes. For K3 fibrations, this enables us to establish the existence of (weak) fundamental domains for movable cones. This is a joint work with Hang Zhao.

博士后/博士报告

Postdoc/PhD Session

报告人：舒成，浙江大学

Speaker: Cheng Shu, Zhejiang, University

题目：特征代数簇的混合霍奇多项式

Title: Mixed Hodge polynomials of character varieties

摘要: Hausel, Letellier 和 Rodriguez-Villegas 计算了一般的半单共轭类定义的特征代数簇的 E-多项式。他们的计算可以得出一个特征代数簇的混合霍奇多项式的猜想的公式。我们首先回顾他们的结果然后引入一种在函数域意义下酉的特征代数簇。用与他们相同的方法也能得到一个这种特征代数簇的猜想的混合霍奇多项式。该公式由麦当劳多项式和花圈麦当劳多项式构成。

Abstract: Hausel, Letellier and Rodriguez-Villegas computed the E-polynomial of character varieties with generic semi-simple conjugacy classes. Their computation led to a conjectural formula for the mixed Hodge polynomial of character varieties. We will recall their results and introduce character varieties that are unitary in the global sense. The same method gives a conjectural formula for the mixed Hodge polynomial, which is built of Macdonald polynomials and wreath Macdonald polynomials.

报告人：吕人杰，中国科学院

Speaker: Renjie Lv, Chinese Academy of Sciences

题目：到正割三次超曲面的退化和极限 Hodge 结构

Title: Degenerations to secant cubic hypersurfaces and limiting Hodge structures

摘要: Veronese 曲面的割线簇是一个奇异三次四维簇，这在 Laza 研究三次四维簇的模空间的工作中起着重要的作用。一个关键的要素是极限混合 Hodge 结构单参数的退化到正割三次四维簇。Hassett 揭示了极限混合 Hodge 结构与二次 K3 曲面之间的 Hodge 理论和几何关系。本文研究了到三次超曲面的退化上的极限 Hodge 结构，后者具体说是 Severi 型的割线簇，可视作 Veronese 型曲面的高级类比。结果表明，Hodge 结构的退化行为在 Hodge 理论方面与三次四维簇的情况略有不同，但在几何方面有相似的规律。利用极限混合 Hodge 结构和 Usui 的部分紧化，我们刻画了相应三次超曲面周期映射的局部延拓。这与 Zhiwei Zhen 合作的工作。

Abstract: The secant variety of the Veronese surface is a singular cubic fourfold, which plays a significant role in Laza's work studying the moduli space of cubic fourfolds. One key ingredient is the limiting mixed Hodge structure on a one-parameter degeneration to the secant cubic fourfold. Hassett revealed Hodge-theoretic and geometric relations between the limit mixed Hodge structure and

degree two K3 surfaces. In this talk, we study the limiting Hodge structures on degenerations to the cubic hypersurface which is the secant variety of Severi variety as the higher analogue of the Veronese surface. We show that the behavior of the degeneration of Hodge structures is slightly different from the case of cubic fourfolds in Hodge-theoretic aspect, but has similar pattern in geometric aspect. Using the limit mixed Hodge structure and Usui's partial compactification, we characterize a local extension of the period map for the corresponding cubic hypersurfaces. This is a joint work with Zhiwei Zhen.

报告人：郭函菲，北京大学

Speaker: Hanfei Guo, Peking University

题目：Gushel—Mukai四维簇上的二次曲线，EPW六次簇和 Bridgeland模空间

Title: Conics on Gushel--Mukai fourfolds, EPW sextics and Bridgeland moduli spaces

摘要：一个一般的Gushel—Mukai (GM) 四维簇上的二次曲线到它的相伴对偶二重EPW六次簇（它是一个超凯勒四维簇）上有一个 \mathbb{P}^1 -纤维化。本次报告中，我会说明一个非常一般的GM四维簇上Kuznetsov分支上的某些稳定对象的Bridgeland模空间，与对偶二重EPW六次簇一致。这解答了Perry--Pertusi—Zhao提出的问题。作为推论，我们证明这种情况下的Kuznetsov—Perry猜想，也即如果两个非常一般的GM四维簇的Kuznetsov分支一致，它们就双有理等价。这是和Zhiyu Liu 以及Shizhuo Zhang合作的结果。

Abstract: Conics on a general Gushel--Mukai(GM) fourfold is an essential \mathbb{P}^1 -fibration over its associated double dual EPW sextic, which is a hyperkähler fourfold. In this talk, I will identify the double dual EPW sextic with the Bridgeland moduli space of stable objects in the Kuznetsov component of a very general GM fourfold. This answers the question raised by Perry--Pertusi--Zhao. As a corollary, we prove the Kuznetsov--Perry conjecture in this case, i.e., if Kuznetsov components of two very general GM fourfolds are equivalent, then, they are birational. This is a joint work with Zhiyu Liu and Shizhuo Zhang.

报告人：张儒轩，复旦大学

Speaker: Ruxuan Zhang, Fudan University

题目：稳定层模空间上的 BV滤过

Title: BV filtrations of moduli space of stable sheaves

摘要：Voisin 在射影超凯勒簇的 CH_0 上引入了一个滤过（BV滤过），作为猜想中的Bloch-Beilinson滤过的反向滤过。当此超凯勒簇是一个K3曲面稳定层模空间时，BV滤过预测中应当被O'Grady在K3曲面上的滤过控制，并等价于Shen-Yin-Zhao的定义。这次报告中，我们验证了这个预测，并得到一些推论。这是和李志远合作的工作。

Abstract: Voisin introduced a filtration (called Beauville-Voisin filtration) on zero-cycles of an arbitrary projective hyper-Kähler manifold as an opposite to the conjectural Bloch-Beilinson filtration. When the hyper-Kähler manifold is a smooth projective moduli space of stable sheaves on a K3 surface, the BV filtration is expected to be controlled by O'Grady's filtration on the K3 surface and be equal to the filtration defined by Shen-Yin-Zhao. We confirm this expectation and obtain some consequences. This is a joint work with Zhiyuan Li.

报告人：邹瑜，复旦大学

Speaker: Yu Zou, Fudan University

题目：弱Q-Fano三维簇上的几个有界性问题

Title: On several boundedness problems on weak Q-Fano 3-folds

摘要：本次报告中，我会介绍我最近关于弱Q-Fano三维簇上反典范体积以及反典范稳定指标上界的工作。这是与江辰的共同工作。

Abstract: In this talk, I will describe my recent work concerning the upper bound of anti-canonical volumes and anti-canonical stability index for weak Q-Fano 3-folds. This is joint work with Chen Jiang.

报告人：杜佳宾，厦门大学

Speaker: Jiabin Du, Xiamen University

题目：小亏格纤维化曲面的辛自同构在 CH_0 上的作用

Title: On the action of symplectic automorphisms of fibred surfaces of lower genus on CH_0

摘要：设 S 是一个有非零几何亏格的复光滑射影曲面。Bloch猜想预测 S 的辛自同构群 $Aut_s(S)$ 在 $CH_0(S)_{\text{alb}}$ 上的作用是平凡的。本次报告中，我会介绍我们最近的关于这个猜想在 S 是小亏格纤维化曲面时（也即椭圆纤维化曲面或者 $g=2$ 纤维化曲面）的结果。这基于和刘文飞的工作以及正在进行的工作。

Abstract: Let S be a complex smooth projective surface with nonvanishing geometric genus. The Bloch conjecture predicts that the group $Aut_s(S)$ of symplectic automorphisms of S acts trivially on $CH_0(S)_{\text{alb}}$. In this talk, I will introduce our recent results on the above conjecture for fibred surfaces of lower genus, say elliptic surfaces, fibrations of genus two. This are based on a joint work and a joint work in progress with Wenfei Liu.

报告人：汪建平，中国科学技术大学

Speaker: Jianping Wang, University of Science and Technology of China

题目：抛物型 I-联络的张量积定理

Title: Tensor product theorem for parabolic l-connections

摘要: 设 X 是定义在代数闭域 k 上的光滑射影簇。设 L 是 X 上的一个丰沛线丛, D 是 X 中的一个既约的正规交叉的有效除子。在此次报告中我将证明 (X,D) 上的两个抛物型 μ - L -半稳定的 l -联络的张量积仍是 μ - L -半稳定的。这里我们假设当 $\text{char}(k)=p>0$ 时, l -联络的秩之和 $\leq p+1$ 。这项工作是与 Mao Sheng 合作完成的。

Abstract: Let X be a smooth projective variety over an algebraically closed field k . Let L be an ample line bundle over X and D a reduced effective normal crossing divisor in X . In this talk, I will show that the tensor product of two parabolic μ - L -semistable l -connections over (X,D) is μ - L -semistable. Here we assume that the sum of the rank of the l -connections $\leq p+1$ if $\text{char}(k)=p>0$. This is a joint work with Mao Sheng.

报告人: 林小进, 中国科学技术大学

Speaker: Xiaojin Lin, University of Science and Technology of China

题目: Sun-Yang-Zuo 猜想

Title: On Sun-Yang-Zuo conjecture

摘要: 秩 2 次数 -1 , 且对数 Higgs 场有 4 个极点的半稳定分次 Higgs 丛的模空间与射影直线同构。如果定义的域是特征 p 的, 则 Higgs-de-Rham 流诱导了一个射影直线的态射。Sun-Yang-Zuo 推测, 这种态射是由椭圆曲线 $\pi: E \rightarrow \mathbb{P}^1$ 上的映射衍生而来的。我们将通过抛物回拉的技术证明它。

Abstract: The moduli space of semi-stable graded Higgs bundle over \mathbb{P}^1 of rank 2 degree -1 , with logarithmic Higgs field which has poles at 4 points, is isomorphic to projective line. If the defining field is of character p , then Higgs de-Rham flow induces a morphism of projective line. Sun-Yang-Zuo conjectured such morphism is descended from p -multiplication by maps on an elliptic curve $\pi: E \rightarrow \mathbb{P}^1$. We will present a proof via parabolic pullback.

报告人: 周琳, 北京大学

Speaker: Lin Zhou, Peking University

题目: Gushel-Mukai 五维簇的 Chow 群

Title: Chow groups of Gushel-Mukai fivefolds

摘要: Gushel-Mukai 簇是一类 Fano 簇, 与三次超曲面有许多共同性质, 尤其是在四维的时候。许多性质已经由 Debarre 和 Kuznetsov 持续研究。在这次报告中, 我会通过非分歧上调给出 Gushel-Mukai 五维簇的 Chow 群的一个描述。

Abstract: Gushel-Mukai varieties are a type of Fano varieties, which share many properties of cubic hypersurfaces, especially cubic fourfolds, and have been intensively studied by Debarre and Kuznetsov. In this talk, I will give a complete description of the Chow groups of complex Gushel-Mukai fivefolds via unramified cohomology.