



冰城 2024 Arakelov 几何与 Nevanlinna 理论 研讨会

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曲炳钢	北京大学
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宋寅翀	北京大学
肖正	北京大学
谢松晏	中国科学院数学与系统科学研究院
杨诚远	北京大学
虞家伟	北京大学





会议日程

11月16日		
8:50-9:00		开幕式
9:00-9:45	谢松晏	Hole probabilities of random zeros on compact Riemann surfaces
9:50-10:35	郭骥	Some applications of Nevanlinna theory and Diophantine geometry
10:35-10:55	休息	
10:55-11:40	宋寅翀	Norm-equivariant metrized divisors on Berkovich spaces
11:45-12:20	陈张弛	关于 n 维射影空间中 $n + 1$ 个超曲面的第二主定理
12:20-14:00	午餐	
14:00-14:45	郭若一	An integration formula of Chern forms on quasi-projective varieties
14:50-15:35	宋嘉瑞	Arithmetic degrees of dynamical systems over fields of characteristic zero
15:35-15:55	休息	
15:55-16:40	虞家伟	On constants in the uniform Mordell conjecture
16:45-17:30	杨诚远	Rationality of Néron–Tate height over function fields

11月17日

9:00-9:45	李尧	On coprimary filtrations
9:50-10:35	肖正	GCD conjecture on Abelian surfaces and arithmetic discriminant
10:35-10:55	休息	
10:55-11:40	骆文斌	Geometric Bogomolov conjecture for semiabelian varieties
11:45-12:20	曲炳钢	Arakelov geometry on flag varieties over function fields
12:20-	午餐及自由讨论	





报告题目与摘要

关于 n 维射影空间中 $n + 1$ 个超曲面的第二主定理

陈张弛（华东师范大学）

假设 n 维射影空间中有 $n + 1$ 个在一般位置的超曲面，不全是超平面。假设它们仅在光滑点处相交，且是横截相交。那么一条代数非退化整曲线关于这些超曲面的亏量和严格小于 $n + 1$ 。这个结果由Dinh Tuan Huynh，孙锐然，谢松晏和我合作完成。

Some applications of Nevanlinna theory and Diophantine geometry

郭骥（中南大学）

We will show a truncated second main theorem of level one with explicit exceptional sets for analytic maps into \mathbb{P}^2 intersecting the coordinate lines with sufficiently high multiplicities. As an application, we will study a special case of Campana's orbifold conjecture. We will also discuss the analogue for function fields.

An integration formula of Chern forms on quasi-projective varieties

郭若一（北京大学）

In this talk, I generalize the formula that the integration of Chern forms of hermitian line bundles equals the algebraic intersection number of the underlying line bundles. I generalize it to a formula on a quasi-projective variety over a complete valuation field which might be archimedean or non-archimedean. Our result has a close relation with the integration of Betti forms and the notion of non-degeneracy of a closed subvariety.

On coprimary filtrations

李尧（西湖大学）

The coprimary filtration is a basic construction in commutative algebra. Recently, Chen and Jeannin proved the uniqueness of such filtration via Harder-Narasimhan theory. In this talk, I will introduce my recent work on the existence and uniqueness of coprimary filtration of modules (not necessarily finitely generated) over a Noetherian ring. Moreover, I will introduce its applications.

Geometric Bogomolov conjecture for semiabelian varieties

骆文斌（北京大学）

We prove the geometric Bogomolov conjecture for semiabelian varieties in the case that the abelian quotient is somewhere totally degenerate. The proof relies on our description of canonical measures on the skeletons of closed subvarieties. This is a joint work with Jiawei Yu.

Arakelov geometry on flag varieties over function fields

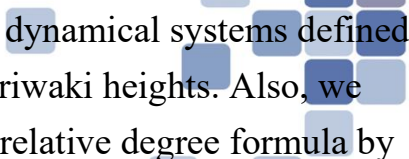
曲炳钢（北京大学）

We compute several Arakelov invariants such as height filtrations, successive minima and the Boucksom-Chen concave transform on flag varieties over function fields. We then discuss some related topics, including Zhang's inequality, augmented base loci and movable cones on flag bundles.

Arithmetic degrees of dynamical systems over fields of characteristic zero

宋嘉瑞（北京大学）

We generalize the arithmetic degree and its related theory to dynamical systems defined over a field of characteristic 0 by taking spread-out and using Moriwaki heights. Also, we study the arithmetic dynamical degree of (X, f) and establish the relative degree formula by





Arakelov geometry method.

The relative degree formula gives a conceptual proof of the fundamental inequality, that is, the upper arithmetic degree is less than or equal to the first dynamical degree in this setting. Moreover, we give a characterization of arithmetic degrees of "transcendental points" in the case $k = \mathbb{C}$, from which we deduce that the arithmetic degree equals to the first dynamical degree for very general points when f is an endomorphism. This is joint work with Wenbin Luo.

Norm-equivariant metrized divisors on Berkovich spaces

宋寅翀（北京大学）

Yuan and Zhang defined adelic line bundles on quasi-projective varieties. They also define an analytification map into the group of continuous norm-equivariant metrized line bundles. We will show that this analytification map is surjective, then we will give some applications about the analytic aspect of Yuan--Zhang's adelic line bundles.

GCD conjecture on Abelian surfaces and arithmetic discriminant

肖正（北京大学）

Vojta's conjecture lies in the heart of Diophantine approximation, which implies the distributions of rational and integral points. We not only have the rational version but also algebraic version of it. The general conjecture is way beyond reach but there is a weaker version of replacing the field discriminant with the arithmetic discriminant. Somehow surprisingly, the estimate of arithmetic discriminant would imply the GCD conjecture on abelian surfaces. We will take the jacobian of curves of genus 2 as an example to illustrate the relation.

Hole probabilities of random zeros on compact Riemann surfaces

谢松晏（中国科学院数学与系统科学研究院）

We establish a convergence speed estimate for hole probabilities of zeros of random

holomorphic sections on compact Riemann surfaces. The proof is based on a density formula of Zelditch, the Abel-Jacobi theory, Fekete points theory, and a new perturbation method. This is joint work (arXiv: 2406.19114) with Hao Wu (NUS).

Rationality of Néron–Tate height over function fields

杨诚远（北京大学）

Using the method of Néron function, Néron proved that the Néron–Tate height of points in an abelian variety over a function field are always rational numbers. However, the method does not apply to height of subvarieties. Our result, using tropical geometry, extends Néron’s result to arbitrary subvarieties. This also gives another perspective on a recent result of Robin de Jong.

On constants in the uniform Mordell conjecture

虞家伟（北京大学）

We get some explicit constants in the uniform Mordell conjecture proved by Dimitrov-Gao-Habegger and Kühne. It is based on Vojta's inequality, the uniform Bogomolov result by Yuan, and the explicit geometric Bogomolov result by Looper-Silverman-Wilms.





与会人员

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