

## 日程安排

12月2日 智华楼四元厅 (224, 225 室)		
08:30-08:50	签 到	
08:50-09:00	开幕式+合影	
时 间	报告人	报告题目
09:00-09:45	杨 炯	Exceptional zeros of $p$ -adic Rankin-Selberg L-functions
09:50-10:35	刘春晖	Arithmetic Fujita approximation over adelic curves
10:35-10:55	茶 歇	
10:55-11:40	李修美	Weight distributions and weight hierarchies of a family of $P$ -ary linear codes
午 休		
14:00-14:45	汪春晖	On the lattice model of the Weil representation
14:50-15:35	胡 甦	SUMMATION OF DIVERGENT SERIES FROM THE VIEWPOINT OF DISTRIBUTIONS
15:35-16:05	茶 歇	
16:05-16:40	张 翀	相对朗兰兹纲领

## 日程安排

12月3日 智华楼四元厅 (224, 225 室)		
时 间	报告人	报告题目
09:00-09:45	沙 敏	代数数的乘性相关性
09:50-10:35	熊 玮	Some results for the arithmetic theta lifting from $SO(3)$ to $Mp(2)$
10:35-10:55	茶 歇	
10:55-11:40	胡 勇	Strong Approximation and Integral Quadratic Forms over Affine Curves
午 休		
14:00-14:45	文 豪	Model Personalization Methods and Algorithms in Federated Learning
14:50-15:35	谌 昭	Thue-Morse 序列和 Rudin-Shapiro 序列的多项式子列

## 报告题目与摘要

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### 报告题目：Thue-Morse 序列和 Rudin-Shapiro 序列的多项式子列

报告人：谌昭（中南大学）

摘要：有限自动机生成的序列被称为自动机序列，这样的序列有着较小的子词复杂度(subword complexity). 对于一个经典的自动机序列 --Thue-Morse 序列，J.-P. Allouche 在考虑其多项式指标子列的自动机性时，发现这类子列的复杂度往往很大，因而不是自动机序列。这次报告，我们将从这一有趣的现象出发，按照时间的顺序，讲述上世纪八十年代以来，人们在这类问题上的发现和进展。

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### 报告题目：SUMMATION OF DIVERGENT SERIES FROM THE VIEWPOINT OF DISTRIBUTIONS

报告人：胡甦（华南理工大学）

ABSTRACT. Let  $\{a_1, a_2, \dots, a_n, \dots\}$  be a sequence of complex numbers which has at most polynomial growth and satisfies an extra assumption. In this talk, inspired by a recent work of Sasane, we give an explanation of the sum

$$a_1 + 2a_2 + 3a_3 + \dots + na_n + \dots,$$

and more generally, for any  $k \in \mathbb{N}$ , the sum

$$1^k a_1 + 2^k a_2 + 3^k a_3 + \dots + n^k a_n + \dots,$$

from the viewpoint of distributions. As applications, we explain the following summation formulas

$$1^k - 2^k + 3^k - \dots = -\frac{E_k(0)}{2},$$

$$1^k + 2^k + 3^k + \dots = -\frac{B_{k+1}}{k+1},$$

$$\epsilon^{1^k} + \epsilon^{2^k} + \epsilon^{3^k} + \dots = -\frac{B_{k+1}(\epsilon)}{k+1},$$

where  $E_k(0)$ ,  $B_k$  and  $B_k(\epsilon)$  are the Euler polynomials at 0, the Bernoulli numbers and the Apostol-Bernoulli numbers, respectively.

This is a joint work with Prof. Min-Soo Kim (Kyungnam University).

**报告题目：Strong Approximation and Integral Quadratic Forms over Affine Curves**

报告人：胡勇（南方科技大学）

摘要：In the classical arithmetic theory of quadratic forms over global fields, strong approximation and the Hasse principle play a very important role. In this talk, we discuss extensions of some results in this direction to function fields of curves defined over more general fields. In particular, we give examples where strong approximation and the Hasse principle for integral quadratic forms hold, and examples where they do not hold. This is based on a joint work with Jing Liu 刘靖 and Yisheng Tian 田乙胜.

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**报告题目：Weight distributions and weight hierarchies of a family of P-ary linear codes**

报告人：李修美（曲阜师范大学）

摘要：The weight distribution and weight hierarchy of a linear code are two important research topics in coding theory. In this paper, by choosing proper defining sets from inhomogeneous quadratic functions over  $F_q^2$ , we construct a family of three-weight  $p$ -ary linear codes and determine their weight distributions and weight hierarchies. Most of the codes can be used in secret sharing schemes.

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**报告题目：Arithmetic Fujita approximation over adelic curves**

报告人：刘春晖（哈尔滨工业大学）

摘要：Fujita approximation is an approximative version of Zariski decomposition of pseudo-effective divisors. More precisely, it says that a power of a big line bundle can be decomposed as the sum of an ample and an effective line bundle under a birational morphism, where the volume of this big line bundle can be approximated by that of the ample one in some sense. An arithmetic analogue over number fields was proved by H. Chen and X. Yuan. In this talk, I will introduce a generalization of them over adelic curves based on one of my works in progress.

### **报告题目：代数数的乘性相关性**

报告人：沙敏（华南师范大学）

摘要：若干个非零复数称为乘性相关的，如果它们满足一个乘性关系式。类似地，复空间中的一个点称为乘性相关点，如果它的坐标都是非零的并且满足一个乘性关系式。这个乘性相关的概念可以自然地推广到在模一个子群的意义下的乘性相关。本报告将从丢番图几何的角度出发，介绍一些关于乘性相关点的有限性结果。

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### **报告题目：On the lattice model of the Weil representation**

报告人：汪春晖（武汉大学）

摘要：In the real field case, Pierre Cartier constructed Weil representations of a Heisenberg group in families using non-self-dual lattices. Jae-Hyun Yang later rewrote this result in another paper. We extend this family of representations to a representation of a Jacobi group by incorporating the Metaplectic group. Furthermore, we extend these results to the  $p$ -adic field.

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### **报告题目：Model Personalization Methods and Algorithms in Federated Learning**

报告人：文豪（中国农业大学）

摘要：Federated learning is an artificial intelligence technology that has emerged with the need for decentralization and privacy protection. It is a new machine-learning paradigm for scenarios where a central node (the server) coordinates multiple sub-nodes (the clients) into a collaborative modeling task. In this scenario, the participants can accomplish the task of collaborative modeling without exposing their private data. Federated learning has become an active branch of machine learning and artificial intelligence.

In this talk, we focus on optimization algorithms for federated learning and their application in personalized federated learning. First, existing optimization algorithms in federated learning will be introduced, especially the decomposition algorithms. The basic idea of the decomposition algorithm is to decompose a large-scale problem

into a series of small-scale problems and process each sub-problem separately so that the sub-problems in the iterative algorithms are easier to solve or easier to parallelize. Typical decomposition algorithms include operator splitting methods, alternating direction multiplier methods, etc. Afterward, algorithms for personalized federated learning will be discussed. Personalized federated learning is a method to deal with federated learning problems with complex data distribution. While training a public model collaboratively, it allows participants to obtain slightly different local models that retain their local characteristics, which improves the applicability of federated learning in related complex scenarios. There are still a lot of open problems in modeling and algorithm design in personalized federated learning. Finally, a new open-source simulation system designed for the verification of the federated learning algorithms will be presented.

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**报告题目：Some results for the arithmetic theta lifting from  $SO(3)$  to  $Mp(2)$**

报告人：熊玮（湖南大学）

摘要：In this talk, we will consider arithmetic theta lifting from  $SO(3)$  to  $Mp(2)$ , and introduce an arithmetic Whittaker-Fourier period formula and an arithmetic Rallis inner product formula. This is joint work with Prof. Ye Tian and Dr. Wei He.

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**报告题目：Exceptional zeros of p-adic Rankin-Selberg L-functions**

报告人：杨炯（青岛大学）

摘要：In this talk, I will introduce the exceptional zero phenomenon of p-adic L-functions and report the recent progress in the Rankin-Selberg case.

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**报告题目：相对朗兰兹纲领**

报告人：张翀（南京大学）

摘要：我的研究工作围绕自守表示的自守周期，以及局部表示的局部周期。这些包含在相对朗兰兹纲领的框架下。我将介绍这方面的一些内容。

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