

李理论与代数表示论相关课题 程序手册

一、会议基本信息

会议名称： 李理论与代数表示论相关课题会议

会议时间： 2026 年 4 月 23 日 - 4 月 27 日

报到日期： 2026 年 4 月 23 日

离开日期： 2026 年 4 月 27 日

会议地点： 中国科学技术大学，合肥

主办单位： 中国科学技术大学

二、会议简介

本次会议旨在汇聚相关领域的专家学者，围绕李理论与代数表示论等相关方向展开深入交流与讨论，促进学术合作与发展。

三、组织委员会

陈洪佳 (中国科学技术大学)

陈小伍 (中国科学技术大学)

戴烜中 (OIST & 南京大学)

郜云 (约克大学)

宋百林 (中国科学技术大学)

叶郁 (中国科学技术大学)

四、报告人

方 明 (中国科学院大学)

胡 峻 (北京理工大学)

胡乃红 (华东师范大学)

姜翠波 (上海交通大学)

李 方 (浙江大学)

李立斌 (扬州大学)

刘公祥 (南京大学)

罗 栗 (华东师范大学)

王 清 (厦门大学)

王栓宏 (东南大学)

汪永杰 (合肥工业大学)

吴泉水 (复旦大学)

余 君 (北京大学)

余妮娜 (厦门大学)

张 健 (华中师范大学)

五、联系人

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六、报告地点

中科大五教5101

七、住宿地点

梅山路18号，安徽饭店

八、就餐地点

23号晚餐：安徽饭店

25号晚宴：安徽饭店三楼逍遥村2号厅

26号晚餐：安徽饭店

24-26号其余餐食：专家楼二楼自助餐厅

报告日程

时间/日期	4 月 24 日 周五	4 月 25 日 周六	4 月 26 日 周日
08:50-09:00	开幕致辞		
09:00-09:45	李方	姜翠波	吴泉水
09:55-10:40	刘公祥	李立斌	王栓宏
茶歇	照片		
11:00-11:45	胡峻	方明	胡乃红
午餐			
14:30-15:15	罗栗	王清	自由讨论
15:25-16:10	张健	余妮娜	
茶歇			
16:50-17:35	汪永杰	余君	
晚餐		晚宴	

4 月 24 日 上午	五教 5101		
	报告人	题目	主持人
08:50-09:00	开幕致辞		
09:00-09:45	李方	从 Markov 方程到半 Markov 方程	姜翠波
09:55-10:40	刘公祥	Reflections for coquasi-Hopf algebras	
10:40-11:00	茶歇		
11:00-11:45	胡峻	On Hecke algebras and Z-graded twisting, Shuffling and Zuckerman functors	吴志祥
11:45-14:30	午餐（专家楼二楼自助餐厅）		
4 月 24 日 下午	五教 5101		
	报告人	题目	主持人
14:30-15:15	罗栗	Invariant theory of i-quantum groups of type AIII	张红莲
15:25-16:10	张健	Gelfand-Tetlin bases for quantum groups at root of unity	
16:10-16:30	茶歇		
16:50-17:35	汪永杰	RTT presentation for iQuantum Group	孙凯文
17:35-	晚餐（专家楼二楼自助餐厅）		

4 月 25 日 上午	五教 5101		
	报告人	题目	主持人
09:00-09:45	姜翠波	On singular vectors of universal affine vertex operator algebras	谭绍滨
09:55-10:40	李立斌	Some trends in representation algebras of Hopf algebras	
10:40-11:00	茶歇		
11:00-11:45	方明	Dominant and global dimension of BGG (parabolic) category O	苏育才
11:45-14:30	午餐（专家楼二楼自助餐厅）		
4 月 25 日 下午	五教 5101		
	报告人	题目	主持人
14:30-15:15	王清	Classification of irreducible modules of the category KL_k for the affine vertex superalgebra	戴烜中
15:25-16:10	余妮娜	Zhu Algebras of Permutation Orbifold Vertex Operator Algebras	
16:10-16:30	茶歇		
16:50-17:35	余君	Branching rule problem	陈洪佳
18:00-	晚宴（安徽饭店三楼逍遥村 2 号厅）		

4 月 26 日 上午	五教 5101		
	报告人	题目	主持人
09:00-09:45	吴泉水	Chevalley Property and determinant ideals of Hopf algebras with large centers	郜云
09:55-10:40	王栓宏	A Schur's Double Centralizer Theorem and Pontryagin Duality	
10:40-11:00	茶歇		
11:00-11:45	胡乃红	The Ding-Frenkel Isomorphism Theorem for two-parameter quantum affine algebra $U_{r,s}(\widehat{\mathfrak{so}_{2n+1}})$ and beyond	叶郁
11:45-14:30	午餐（专家楼二楼自助餐厅）		
14:30-17:35	自由讨论		
18:00-	晚餐（安徽饭店）		

题目和摘要

Dominant and global dimension of BGG (parabolic) category $\mathcal{O}$

方明, 中国科学院大学

Though global dimension is central to homological theory, dominant dimension remains relatively obscure. In this talk, I will review briefly some basics on dominant dimension, and (parabolic) category $\mathcal{O}$. We recall the work by Mazorchuk and his collaborators on global dimension of (parabolic) category $\mathcal{O}$, and present my recent joint work with Yuhui Liu on the dominant dimension of (parabolic) category $\mathcal{O}$, in terms of Kazhdan-Lusztig a -function.

On Hecke algebras and $\mathbb{Z}$ -graded twisting, Shuffling and Zuckerman functors

胡峻, 北京理工大学

Let $\mathfrak{g}$ be a complex semisimple Lie algebra with Weyl group (W, S) . The Iwahori-Hecke algebra $H(W)$ associated to W can be categorified by the $\mathbb{Z}$ -graded projective functors of the BGG category $\mathcal{O}$. In this talk I shall describe another two new categorifications of $H(W)$ via twisting functor T_w and shuffling functors C_w . As a result, we obtain graded character formulae for twisting simple modules and shuffling simple modules. We also characterize the action of derived Zuckerman functors on simple modules and present an algorithm to compute the graded character of $T_s M$ for general $M \in \mathcal{O}$ and $s \in S$. This is a joint work with Fang Ming and Sun Yujiao.

The Ding-Frenkel Isomorphism Theorem for two-parameter quantum affine algebra $U_{r,s}(\widehat{\mathfrak{so}}_{2n+1})$ and beyond

胡乃红，华东师范大学

From the theory of finite-dimensional weight modules, we get the basic braided R -matrix $\hat{R}$ of $U_{r,s}(\mathfrak{so}_{2n+1})$. For its FRT presentation $U(\hat{R})$, we achieve two word-formation methods of quantum Lyndon bases (whose bracketing rules are regulated by the RLL -formalism) and elucidate their distribution rule within the triangular L -matrix. Consequently, we contribute an algebraic proof for establishing an isomorphism between the Drinfeld-Jimbo presentation and the FRT presentation. The essential distinction caused by the “*type D phenomenon*”—prevalent in the realm of two-parameter quantum affine algebras—from its one-parameter counterpart, has been figured out via a representation-theoretic perspective. In the affine setting, we first derive two spectral parameter-dependent R -matrices through the Yang-Baxterization. Next, we select the only one that satisfies the intertwining property with respect to the evaluation representation. Accordingly, we obtain the RLL realization of $U_{r,s}(\widehat{\mathfrak{so}}_{2n+1})$ through the Gauss decompositions of the generating matrices. Finally, we contribute an algebraic proof to the Ding-Frenkel Isomorphism Theorem between the Drinfeld realization and the RLL realization. This is a joint work with Xiao Xu and R.S. Zhuang.

On singular vectors of universal affine vertex operator algebras

姜翠波，上海交通大学

We will talk about some recent progress on determining singular vectors of affine universal affine vertex operator algebras. This talk is based on joint works with Jingtian Song and Yubing Zhang.

从 Markov 方程到半 Markov 方程

李方, 浙江大学

用丛代数方法研究丢番图方程已成为丛代数理论与数论联系的一个重要方面。本报告首先介绍 Markov 方程及一些类 Markov 方程用丛代数方法的求解方法, 并介绍相应的有限域上方程的猜想及其进展。特别给出了一般丢番图方程在整数环与有限域上解集在丛对称群作用下轨道及其连通性之间的关系。最后, 介绍了对半 Markov 方程的研究, 刻画了任意素数 p 时有限域上丛对称群的结构。

Some trends in representation algebras of Hopf algebras

李立斌, 扬州大学

Representation algebras or representation rings provide a natural framework for the study of tensor category, such as the categories of finite dimensional representations over group algebras, Lie algebras, Hopf algebras and quantum groups, and have been proven extremely useful in representation theory and other fields. In this talk, I will recall a little bit history and then report some trends in representation algebras of some classes of Hopf algebras. The results reported here are based on the joint work of Liufeng Cao, Gongxiang Liu, Zhihua Wang and Yinhua Zhang.

Reflections for coquasi-Hopf algebras

刘公祥, 南京大学

Reflection theory for Hopf algebras is a fundamental tool for classification of pointed Hopf algebras. Through reflection theory, one can define the corresponding Weyl groupoid and root system theory for Nichols algebras. We will explain this theory in this talk at first. For a long time, we don't know how to generalize such tool to (co)quasi-Hopf algebras. Secondly, we show that we have such an theory for (co)quasi-Hopf algebras with bijective antipode briefly. This is a joint work with Dr. Bowen Li.

Invariant theory of i-quantum groups of type AIII

罗栗, 华东师范大学

We develop an invariant theory of quasi-split i-quantum groups U^i of type AIII on a tensor space arising from Howe dualities. The first and second fundamental theorems for U^i -invariants are derived. This is a joint work with Zheming Xu.

Classification of irreducible modules of the category KL_k for the affine vertex superalgebra

王清, 厦门大学

In this talk, we present our recent results on the semisimplicity and the classification of irreducible modules in the category KL_k for the affine vertex superalgebra at boundary admissible level k . This is a joint work with Huaimin Li.

A Schur's Double Centralizer Theorem and Pontryagin Duality

王栓宏, 东南大学

In this talk we will introduce the notion of a braided Lie algebra in the category of Yetter-Drinfeld modules over a weak algebraic quantum group and study its universal enveloping algebras which is a Hopf algebra. Then we consider Schur double centralizer theorem (or Schur-Weyl duality) under suitable conditions.

RTT presentation for iQuantum Group

汪永杰, 合肥工业大学

In this talk, I will introduce the RTT presentation for iquantum group of quasi-split type. This is a joint work with Zhihua Chang and Ming Lu.

Chevalley Property and determinant ideals of Hopf algebras with large centers

吴泉水, 复旦大学

Any affine Cayley-Hamilton Hopf algebra, in the sense of De Concini-Procesi-Reshetikhin-Rosso, is finitely generated as a module over its center. We prove that any affine Hopf algebra admitting a large central Hopf subalgebra can be endowed with a Cayley-Hamilton Hopf algebra structure by using the Hattori-Stalling trace map. This is used as a general framework for the studying of the irreducible representations of some quantum groups at root of unity. For any affine Cayley-Hamilton Hopf algebras, the identity fiber algebra has naturally a Hopf algebra structure. The category of finite-dimensional modules over any fiber algebra of H is an indecomposable exact module category over the tensor category of finite-dimensional modules over the identity fiber algebra. The irreducible representations, for example, the Chevalley property, of H are strongly related to the discriminant ideals of H . In fact, we prove that H has the Chevalley property if and only if its identity fiber algebra has the Chevalley property and all the discriminant ideals are trivial. The level of the lowest discriminant ideal of H is the Frobenius-Perron dimension of the identity fiber algebra plus one. This talk is based on recent works with Huang, Mi, Qi and Zhu.

Branching rule problem

余君, 北京大学

In this talk, we introduce classical branching rules like Littlewood-Richardson rule and recent development like Gan-Gross-Prasad conjecture. Finally, I discuss some of my works on the branching rule problem.

Zhu Algebras of Permutation Orbifold Vertex Operator Algebras

余妮娜, 厦门大学

In this talk, I will discuss Zhu algebras associated with permutation orbifold vertex operator algebras, along with some related topics.

Gelfand-Tetlin bases for quantum groups at root of unity

张健，华中师范大学

One of the central problems of representation theory is to construct a basis in the representation space and to find the representation matrices in the basis. A solution of this problem for the general linear Lie algebra and the orthogonal Lie algebra was given by Gelfand and Tsetlin. Their method has since been generalized to various other algebras, including Lie superalgebras, Yangians, finite W-algebras, and quantum groups. In this talk, we will present the construction of Gelfand-Tsetlin basis for quantum groups at root of unity. We construct explicit bases for the representation spaces and describe the action of the generators on these basis vectors. This talk is based on joint work with Hao Chang and Ruiying Hou.

