Registration : August 14th, 2017

Time : August 14-17, 2017

Lecture Room : 5207, The Fifth Teaching Building, East Campus USTC

Organisers:

Yu Ye University of Science and Technology of China

Yinhuo Zhang University of Hasselt

The conference is sponsored by :

Scool of Mathematical Sciences, USTC

Wu Wen-Tsun Key Laboratory of Mathematics, CAS.

National Natural Science Foundation of China

Accommodation :

Guest House: East Campus, USTC, No.96 Jinzhai Road, Baohe District, Hefei

City Home Inn: No.118 Jinzhai Road, Baohe District, Hefei

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August 15 (Tues.)

8:15 - 8:30	Opening Ceremony
8:30 - 9:10	Title： Double-Bosonization and Dual Bases of C_q[SL_2] and C_q[SL_3]
	Speaker： Shahn Majid
9:20 -10:00	Title： The Hurwitz problem on compositions of quadratic forms
	Speaker： Hua-Lin Huang
10:00-10:30	Break
10:30-11:10	Title： Quantum actions on discrete quantum spaces
	Speaker： Kenny De Commer
11:20-12:00	Title： Pontryagin Duality for Weak Multiplier Hopf Algebras with Integrals
	Speaker： Shuan-Hong Wang
12:00-14:30	Lunch(Guest House)
14:30-15:10	Title： Classical left regular left quotient ring of a ring and its semisimplicity criteria
	Speaker： Vladimir Bavula
15:20-16:00	Title： Some families of finite-dimensional Hopf algebras without Chevalley property
	Speaker： Nai-Hong Hu
16:00-16:30	Break
16:30-17:10	Title： Poisson Hopf algebras and co-Poisson Hopf algebras
	Speaker： Quan-Shui Wu
17:10-	Dinner (Guest House)

August 16(Wed.)

8:30 - 9:10	Title： Ringel-Hall algebras beyond their quantum groups
	Speaker： Jie Xiao
9:20 -10:00	Title： Modified Ringel-Hall algebras and derived Hall algebras
	Speaker： Lian-Gang Peng
10:00-10:30	Break
10:30-11:10	Title： Cleft wreath algebras
	Speaker： Blas Torrecillas
11:20-12:00	Title： The positivity and D-vector positivity of cluster algebras and generalized Laurent phenomenon algebras
	Speaker： Fang Li
12:00-14:30	Lunch(Guest House)

August17(Thur.)

8:30 - 9:10	Title： On spherical fusion categories of odd dimension
	Speaker： Richard Ng
9:20 -10:00	Title： Quasi-Frobenius-Lusztig kernels
	Speaker： Gong-Xiang Liu
10:00-10:30	Break
10:30-11:10	Title： Hopf algebras, monoidal categories and geometric invariant theory
	Speaker： Ehud Meir
11:20-12:00	Title： Fragments and cofragments in group and Lie algebra theory
	Speaker： Frederik Caenepeel
12:00-14:30	Lunch(Guest House)
14:30-15:10	Title： Types of Serre subcategories of Grothendieck categories
	Speaker： Pu Zhang
15:20-16:00	Title： Finite group actions on Koszul Artin-Schelter regular algebras and BGG correspondence.
	Speaker： Ji-Wei He
16:00-16:30	Break
16:30-17:10	Title： Descent and Galois theory for Hopf categories
	Speaker： Stefaan Caenepeel
17:10-	Dinner (Guest House)

Titles and Abstracts

Speaker : Vladimir Bavula (University of Sheffield)

Title: Classical left regular left quotient ring of a ring and its semisimplicity criteria

Abstract: Goldie's Theorem (1958, 1960) is a semisimplicity criterion for the classical left quotient ring of a ring. Semisimplicity criteria are given for the classical left regular left quotient ring. As a corollary, two new semisimplicity criteria are obtained for the classical left quotient ring of a ring (in the spirit of Goldie). Applications are given for the algebra of polynomial integro-differential operators.

Speaker : Frederik Caenepeel (University of Antwerp)

Title: Fragments and cofragments in group and Lie algebra theory

Abstract: My PhD topic deals with the development of fragment theory, which can be seen as a generalization of representation or module theory. In this talk I will present some results of fragment theory in the area of groups and Lie algebras. As I will point out, the starting point to consider fragments is a positive algebra filtration. Interesting situations are obtained by considering a chain of finite groups or Lie algebras with associated algebra filtration by looking at the group algebras or universal enveloping algebras. The step from groups and Lie algebras to Hopf algebras is a natural one, hence we propose the definition of a cofragment. If time permits I will also present some first results on cofragments. All this is joint work with Fred Van Oystaeyen.

Speaker : Stefaan Caenepeel (Free University of Brussels)

Title: Descent and Galois theory for Hopf categories

Abstract: A semi-Hopf category is a category enriched over the category of coalgebras over a field k; otherwise stated, it is a k-linear category in which every vectorspace of homomorphisms between two objects is a coalgebra, with some extra compatibility conditions. An antipode on a semi-Hopf category is a collection of maps $S_{x,y}$: $\mathrm{Hom}(y, x) \to \mathrm{Hom}(x, y)$, for all objects x, y, satisfying the

appropriateconvolution rules. Hopf categories are semi-Hopf categories with an antipode. Hopf categories with one object correspond bijectively to ordinary Hopf algebras. The notion is related to several recently developed notions in Hopf algebra theory, such as Hopf group (co)algebras, weak Hopf algebras and duoidal categories. The fundamental theorem for Hopf modules and some of its applications to Hopf categories, opening the way to the development of Galois theory.

First we develop descent theory for linear category. Given a linear category as an extension of a diagonal category, we introduce descent data, and the category of descent data is isomorphic to the category of representations of the diagonal category, if some flatness assumptions are satisfied. Then Hopf-Galois descent theory for linear Hopf categories, the Hopf algebra version of a linear category, is developed. This leads to the notion of Hopf-Galois category extension. We have a dual theory, where actions by dual linear Hopf categories on linear categories are considered. Hopf-Galois category extensions over groupoid algebras correspond to strongly graded linear categories.

The first part of the talk is joint work with Eliezer Batista and Joost Vercruysse. The second part is joint work with Timmy Fieremans.

Speaker : Kenny De Commer (Free University of Brussels)

Title: Quantum actions on discrete quantum spaces

Abstract: S.L. Woronowicz introduced the notion of a compact quantum group, which on the purely algebraic level consists of a co-semisimple Hopf algebra with *-structure for which the associated normalized invariant functional is positive. One can make sense of actions of such compact quantum groups on operator algebras, i.e. algebras of bounded operators on some Hilbert space, closed under a certain topology. We will be interested in actions on operator algebras which are a (possibly infinite) direct sum of finite-dimensional matrix algebras over some index set I, which we interpret as the quantum analogue of a discrete space. We show that to any such action on a discrete quantum space we can associate an equivalence relation on I, which classically corresponds to the partition of a space into orbits of the action, and we show that the orbits of this

equivalence relation are finite. We then apply these results to generalize the classical theory of Clifford, concerning the restrictions of representations to normal subgroups, to the framework of quantum subgroups of discrete quantum groups. This is joint work with Pawel Kasprzak, Adam Skalski and Piotr Soltan.

Speaker : Ji-Wei He (Hangzhou Normal University)

Title: Finite group actions on Koszul Artin-Schelter regular algebras and BGG correspondence.

Abstract: In this talk, I will report some recent progress on finite group actions on Koszul Artin-Schelter regular algebras. Some new invariants related to the group actions were introduced in the study of group actions, which were applied to study the singularities of the invariant subalgebras (both in the isolated and non-isolated cases).

Speaker : Nai-Hong Hu (East China Normal University)

Title: Some families of finite-dimensional Hopf algebras without Chevalley property

Abstract: The classification of finite dimensional Hopf algebras of given dimensions is a hard open problem. In this talk we will introduce some related background and some existing theories, and some classes we obtained recently. This is a joint work with Rongchuan Xiong.

Speaker :Hua-Lin Huang (Huaqiao University)

Title: The Hurwitz problem on compositions of quadratic forms

Abstract: We shall give an introduction to the Hurwitz problem on compositions of quadratic forms and report some recent progress via an approach of Hopf algebras and tensor categories.

Speaker : Fang Li (Zhejiang University)

Title: The positivity and D-vector positivity of cluster algebras and generalized Laurent phenomenon algebras

Abstract: In this talk, we will introduce the notion of generalized Laurent phenomenon algebras and try to use it to oversee the essence of cluster theory. Following this method, the conjectures on d-vectors and g-vectors respectively of cluster algebras are solved. This is a joint work with Peigen Cao.

Speaker : Gong-Xiang Liu (Nanjing University)

Title: Quasi-Frobenius-Lusztig kernels

Abstract: Quasi-Frobenius-Lusztig kernels can be regarded as quasi-Hopf analogues of Frobenius-Lusztig kernels. We will compare the developments of Hopf algebras and quasi-Hopf algebras, and from which we gave the construction of these quasi-Hopf analogues. Some parts of this talk are based on a joint work with professors Fred van Oystaeyen and Yinhuo Zhang.

Speaker : Shahn Majid (Queen Mary University of London)

Title: Double-Bosonization and Dual Bases of $C_q[SL_2]$ and $C_q[SL_3]$

Abstract: The talk is based on my recent work with Ryan Aziz. We find a dual version of a previous double-bosonisation theorem whereby each finite-dimensional braided-Hopf algebra B in the category of comodules of a coquasitriangular Hopf algebra A has an associated coquasitriangular Hopf algebra $\mathrm{coD}_A(B)$. As an application we find new generators for $C_q[SL_2]$ reduced at q a primitive odd root of unity with the remarkable property that their monomials are essentially a dual basis to the standard PBW basis of the reduced Drinfeld-Jimbo quantum enveloping algebra $u_q[sl_2]$. Our methods apply in principle for general $C_q[G]$ as we demonstrate for $C_q[SL_3]$ at certain odd roots of unity.

Speaker：Ehud Meir (University of Hamburg)

Title: Hopf algebras, monoidal categories and geometric invariant theory

Abstract: In this talk I will describe a study of Hopf algebras by tools from symmetric monoidal categories and geometric invariant theory. I will explain how the study of finite dimensional semisimple Hopf algebras can be reduced into studying scalar invariants, and explain the connections of these scalars to some well known invariants (such as the Reshetikhin Turaev invariants of 3-manifolds and Frobenius-Schur indicators). I will also explain how one can receive some new finiteness results for Hopf algebras by using symmetric monoidal categories. More precisely, I will explain why every finite dimensional semisimple Hopf algebra admits at most finitely many Hopf orders over a given number ring.

Speaker : Richard Ng (Louisiana State University)

Title: On spherical fusion categories of odd dimension

Abstract: A classical theorem of Burnside asserts that a finite group G has no nontrivial self-dual irreducible complex representation if and only if G has odd order. This result has been recently generalized to integral fusion categories. However, there exists nontrivial self-dual simple object in a non-integral fusion category of odd dimension. In this talk, we will discuss a relation satisfied by the self-dual simple objects of a modular tensor category of odd dimension in terms of their Frobenius-Schur indicators.

Speaker : Lian-Gang Peng (Sichuan University)

Title: Modified Ringel-Hall algebras and derived Hall algebras

Abstract: In this talk, I will introduce modified Ringel-Hall algebras of complexes over hereditary abelian categories. It is shown that there is an embedding from the derived Hall algebra to the modified Ringel-Hall algebra. This is a joint work with Ji Lin.

Speaker : Blas Torrecillas (University of Almeria)

Title: Cleft wreath algebras

Abstract: We will study this class of wreath algebras and its connections with cleft

cowreath. We will present several situations where this algebras appears in a natural way: crossed product by a coalgebra, generalized crossed products and quasi-Hopf bimodules. This is a joint work with D. Bulacu.

Speaker : Shuan-Hong Wang (Southeast University)

Title: Pontryagin Duality for Weak Multiplier Hopf Algebras with Integrals

Abstract: We generalize the main result of the first author Van Daele (1998) Adv. Math. 140 (1998), 323--366.) on the Pontryagin duality of multiplier Hopf algebras with integrals to weak multiplier Hopf algebras with integrals; we illustrate this dualityby considering the two natural weak multiplier Hopf algebras associated with a groupoid in detail and show that they are dual to each other in the sense of the above duality.

Speaker : Quan-Shui Wu (Fudan University)

Title: Poisson Hopf algebras and co-Poisson Hopf algebras

Abstract: Co-Poisson structure (or coalgebra) is a dual concept of Poisson structure in categorial point of view. It arises also in mathematics and mathematical physics naturally.In the talk I will start from the definitions and basic properties of co-Poisson structures.The Hopf dual H° of any Poisson Hopf algebra H is proved to be a co-Poisson Hopf algebra provided H is noetherian. It is proved that there is no nontrivial Poisson Hopf structure on the universal enveloping algebra of a non-abelian Lie algebra.So the polynomial Hopf algebra, viewed as the universal enveloping algebra of a finite-dimensional abelian Lie algebra, is considered.The Poisson Hopf structures on polynomial Hopf algebras are exactly linear Poisson structures. The co-Poisson structures on polynomial Hopf algebras are characterized. Some correspondences between co-Poisson and Poisson structures are also established. This is a joint work with Lou Qi.

Speaker : Jie Xiao (Tsinghua University)

Title: Ringel-Hall algebras beyond their quantum groups

Abstract: This talk is my recent joint work with Fan Xu and Minghui Zhao. We generalize the categorical constructions of a quantum group and its canonical basis

introduced by Lusztig to the generic form of the whole Ringel-Hall algebra. We clarify the explicit relation between the Green formula and the restriction functor. By a geometric way to prove the Green formula, we show that the Hopf structure of a Ringel-Hall algebra can be categorified under Lusztig's framework.

Speaker : Pu Zhang (Shanghai Jiaotong University)

Title: Types of Serre subcategories of Grothendieck categories

Abstract: Every Serre subcategory $\mathcal{S}$ of an abelian category $\mathcal{A}$ is assigned a unique type. Roughly speaking, it is given by a pair $(m, -n)$ of numbers, where m (resp. n) counts how many times one can form left (resp. right) adjoints starting from i and Q, where $i: \mathcal{S} \to \mathcal{A}$ is the inclusion functor and $Q: \mathcal{A} \to \mathcal{A}/\mathcal{S}$ is the quotient functor. The main result gives a complete list of all the types of Serre subcategories of Grothendieck categories:

$$(0,0), (0,-1), (1,-1), (0,-2), (1,-2), (2,-1), (+\infty, -\infty).$$

The main tool used is (right, left) recollements of abelian categories. Two observations are technically crucial in proving the main result: the exactness of all the functors in a recollement of abelian categories forces the recollement to split; and any left recollement of a Grothendieck category can be extended to a recollement. This is a joint work with J. Feng.

Name List

参会人员名单（按姓名首字母排序）

Name	Affiliation
Yan-Hong Bao	Anhui University
Vladimir Bavula	The University of Shefield
Frederik Caenepeel	University of Antwerp
Stefaan Caenepeel	Free University of Brussels
Liang Chang	Nankai University
Hong-Jia Chen	University of Science and Technology of China
Hui-Xiang Chen	Yangzhou University
Jia-Lei Chen	Beijing University of Technology
Quan-Guo Chen	Qufu Normal University
Xiao-Wu Chen	University of Science and Technology of China
Yong-Sheng Cheng	Henan University
Kenny De Commer	Free University of Brussels
Zhong-Ping Fan	Ocean University of China
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Ji-Wei He	Hangzhou Normal University
Ruben Henrard	Univeristy of Hasselt
Nai-Hong Hu	East China Normal University
Hua-Lin Huang	Huaqiao University
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Name	Affiliation
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Li-Bin Li	Yangzhou University
Ya-Nan Lin	Xiamen University
Gong-Xiang Liu	Nanjing University
Guo-Hua Liu	Southeast Univeristy
Li-Yu Liu	Yangzhou University
Ling Liu	Zhejiang Normal University
Di-Ming Lu	Zhejiang University
Tao Lu	Huaqiao University
Dao-Wei Lu	Jining University
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Name	Affiliation
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Yu-Ping Yang	Southwest University

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校园地图


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