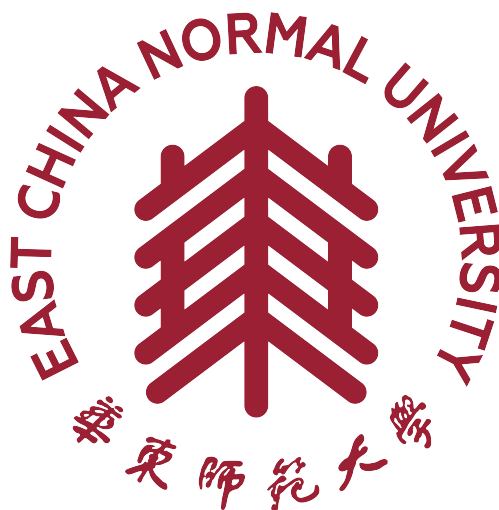


代数与表示论国际研讨会

International Workshop on Algebra and Representation Theory
in honor of Alexander Zimmermann

会议程序册

Conference Program Book



中国 上海 华东师范大学
East China Normal University, Shanghai, China

2024年1月17日 – 21日
January 17 - 21, 2024

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1 组织与致谢 Organizations and Acknowledgements

会议组织者 Conference Organizers

Intan MUCHTADI	(Institut Teknologi Bandung, Indonesia)
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Dellavitha NASUTION	(Institut Teknologi Bandung, Indonesia)
Zhengfang WANG	(Nanjing University, China)
Weiguo LYU	(Anhui University, China)

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2 会议指南 Conference Guide

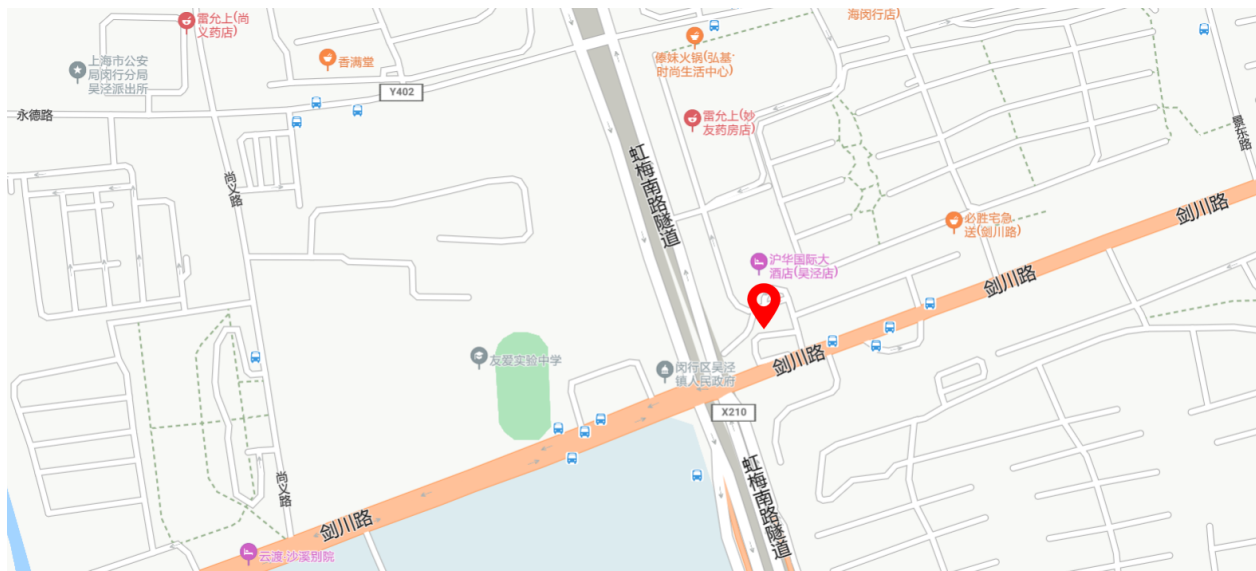
2.1 会议流程 Conference Procedure

1 月 17 日 14:00 - 22:00 报到, 1 月 18 日 – 20 日全天与 1 月 21 日上午开会, 1 月 21 日下午离会。

报到地点: 上海市闵行区剑川路368号沪华国际大酒店(吴泾店)。

Check-in is on January 17th from 14:00 to 22:00. The conference runs from January 18th to the morning of January 21st, with check-out in the afternoon.

Check-in location: Huhua International Hotel (Wujing Branch), No. 368 Jianchuan Road, Minhang District, Shanghai.



2.2 住宿与用餐地点 Accommodation and Dining Location

上海市闵行区剑川路368号沪华国际大酒店(吴泾店)。

Huhua International Hotel (Wujing Branch), No. 368 Jianchuan Road, Minhang District, Shanghai.

2.3 会议地点 Conference Location

华东师范大学闵行校区数学楼102报告厅。住宿酒店与会议地点的路线图见图 1。

Mathematics Building 102 Lecture Hall, Minhang Campus, East China Normal University. See Figure 1 for the route map from the hotel to the conference venue.



图 1: 路线图 Figure 1: Route map

3 会议日程 Conference Schedule

3.1 1月18日 January 18th

Time	Talks		Chair
8:30 - 9:10	Opening ceremony		Guodong ZHOU
9:20 - 10:00	Quanshui WU Fudan University	Irreducible representations and discriminant ideals over some module-finite algebras	
10:00 - 10:20	Tea Break		
10:20 - 11:00	Rasool HAFEZI NUIST	G-semisimple algebras	
11:10 - 11:50	Fei XU Shantou University	On cohomological characterizations of endotrivial modules	
12:10 - 13:00	Lunch		
14:00 - 14:40	Bernhard KELLER Université Paris Cité (online)	Gorenstein algebras from ice quivers with potential	Intan MUCH- TADI
14:50 - 15:30	Huanhuan LI Anhui University	Bifurcation-splittings of graphs and Leavitt path algebras	
15:30 - 16:00	Tea Break		
16:00 - 16:40	Yuming LIU Beijing Normal University	A generalization of Dugas' construction on stable auto-equivalences for symmetric algebras	
16:50 - 17:30	Hongxing CHEN Capital Normal University	Bounded t-structures, finitistic dimensions and singularity categories of triangulated categories	
18:00 - 20:00	Dinner		

3.2 1月19日 January 19th

Time	Talks		Chair
8:30 - 9:10	Changchang XI Capital Normal University	Equivalence relations VS derived equivalences	Li LUO
9:20 - 10:00	Xianhui FU Northeast Normal University	0-dimensional ideal approximation theory	
10:00 - 10:20	Tea Break		
10:20 - 11:00	Domenico FIORENZA Sapienza Università di Roma	Clifford algebras, Fock modules and projective 2-representations of quadratic vector spaces	
11:10 - 11:50	Xiao-Wu CHEN USTC	An introduction to canonical derived equivalences	
12:10 - 13:00	Lunch		
14:00 - 14:40	Stanislas HERSCOVICH Université Grenoble Alpes (online)	Resolutions of quadratic algebras	Naihong HU
14:50 - 15:30	Alberto CATTANEO Universität Zürich	Poisson structures from corners of field theories	
15:30 - 16:30	Conference Photo and Tea Break		
16:30 - 17:10	Mohammad KESHAVARZ Nantong Univeristy	Higher Auslander-Gorenstein algebras and Gabriel topologies	
17:20 - 18:00	Liping LI Hunan Normal University	Sheaves of modules over left rooted EI categories	
18:30 - 20:30	Conference Dinner		

3.3 1月20日 January 20th

Time	Talks		Chair
8:30 - 9:10	Andrea SOLOTAR Universidad de Buenos Aires	The Hochschild cohomology ring of monomial path algebras	Zhengfang WANG
9:20 - 10:00	Wei HU Beijing Normal University	The stable functor and its applications	
10:00 - 10:20	Tea Break		
10:20 - 11:00	Jiaqun WEI Nanjing Normal University	Sincere modules and the vanishing condition	
11:10 - 11:50	Manuel SAORIN Universidad de Murcia	Hearts of set-generated t -structures have a set of generators	
12:10 - 13:00	Lunch		
14:00 - 14:40	Kai WANG ECNU	Deformation theory of Rota-Baxter algebras	Weiguo LYU
14:50 - 15:30	Haibo JIN Universität zu Köln (online)	d -hearts in triangulated categories	
15:30 - 16:00	Tea Break		
16:00 - 16:40	Yilin WU USTC	(Relative) AGK's constructions and Higgs constructions	
16:50 - 17:30	Jun CHEN ECNU	Minimal model for the operad of (relative) Rota-Baxter Lie algebras with weight	
18:00 - 20:00	Dinner		

3.4 1月21日 January 21st

Time	Talks		Chair
8:30 - 9:10	Serge BOUC CNRS	Diagonal p -permutation functors and Alperin's weight conjecture	Alexander ZIMMER-MANN
9:20 - 10:00	Nadia ROMERO Universidad de Guanajuato	Hochschild cohomology for functors on linear symmetric monoidal categories	
10:00 - 10:20	Tea Break		
10:20 - 11:00	Jiwei HE Hangzhou Normal University	An introduction to Shephard-Todd-Chevalley Theorem for finite group (Hopf algebra) actions on AS-regular algebras	
11:10 - 11:50	Pu ZHANG Shanghai Jiao Tong University	Model structure from one cotorsion pair	
12:10 - 13:00	Lunch		

4 题目与摘要 Titles and Abstracts

Diagonal p -permutation functors and Alperin's weight conjecture

Serge BOUC

Centre National de la Recherche Scientifique, France

Abstract: In the first part of this talk, I will report on a joint work with Deniz Yılmaz on diagonal p -permutation functors. For an algebraically closed field k of positive characteristic p , and a commutative ring R , a diagonal p -permutation functor over R is defined as an R -linear functor from the category of finite groups and diagonal p -permutation bimodules to the category of all R -modules. The main examples of such functors are direct summand of representable functors associated to pairs (G, b) of a finite group G and a block idempotent b of kG .

We show in particular that if R is an algebraically closed field of characteristic 0, then the category of diagonal p -permutation functors over R is semisimple, and we classify and describe the simple functors. We also compute explicitly the decomposition of functors associated to blocks as direct sums of simple functors. This leads to a characterization of nilpotent blocks in terms of their associated functors, and also to a finiteness theorem which is a (weak) functorial version of Donovan's conjecture.

The second part of the talk will be devoted to a related recent joint work with Robert Boltje and Deniz Yılmaz, in which we interpret Alperin's weight conjecture (in its blockwise form) in terms of diagonal p -permutation functors.

Poisson structures from corners of field theories

Alberto CATTANEO

Universität Zürich, Switzerland

Abstract: The BV formalism and its shifted versions in field theory have a nice compatibility with boundary structures. Namely, one such structure in the bulk induces a shifted (possibly degenerated) version on its boundary, which can be interpreted as a Poisson structure (up to homotopy). I will present the results for some field theories, in particular, 4D BF theory and 4D gravity.

Bounded t -structures, finitistic dimensions and singularity categories of triangulated categories

陈红星 Hongxing CHEN

中国 首都师范大学 Capital Normal University, China

Abstract: In this talk, we establish some very general results about the existence of bounded t -structures on (not necessarily algebraic or topological) triangulated categories and the invariance of triangulated categories under completion. Our general treatment, when specialised to the case of noetherian schemes, immediately gives us Neeman's theorem on regularity (a major generalization of a conjecture by Antieau, Gepner and Heller) as an application and significantly generalizes another remarkable theorem by Neeman about the equivalence of bounded t -structures on bounded derived categories of coherent sheaves. When specialised to other cases like (not necessarily commutative) rings, nonpositive DG-rings, connective ring spectra, triangulated categories without models, etc., we get many other applications. All of these results convey that the singularity category, in our sense, is an obstruction to the existence of bounded t -structures. This reports a joint work with Rudradip Biswas, Chris Parker, Kabeer Manali Rahul and Junhua Zheng.

Minimal model for the operad of (relative) Rota-Baxter Lie algebras with weight

陈骏 Jun CHEN

中国 华东师范大学 East China Normal University, China

Abstract: In this talk, I will introduce the deformation and homotopy theory for the (relative) Rota-Baxter Lie algebras with weight. More precisely, I will define the deformation complex of Rota-Baxter Lie algebras with weight and construct an L_∞ -algebra structure on it. Just as the philosophy of deformation theory raised by Deligne, it will be shown that this L_∞ -algebra describes the deformation theory for the Rota-Baxter Lie algebras with weight. As a consequence, the homotopy Rota-Baxter Lie algebras with weight and its operad, the minimal model for the operad of Rota-Baxter Lie algebras with weight, are introduced. Conversely, this minimal model can reconstruct the L_∞ -algebra controlling the deformation theory for the Rota-Baxter Lie algebras with weight. Finally, by the coloring process, we obtain the minimal model for the colored operad of the relative Rota-Baxter Lie algebras.

An introduction to canonical derived equivalences

陈小伍 Xiao-Wu CHEN

中国 中国科学技术大学 University of Science and Technology of China, China

Abstract: It is well known that the notion of standard derived equivalence behaves well only for flat algebras. However, there are examples of derived equivalences between flat algebras and non-flat algebras; such examples appear naturally in the study of tilting theory for hereditary orders by Koenig-Zimmermann in 1996. Based on Rickard and Keller's classical work, we propose the notion of canonical derived equivalences between arbitrary algebras. We will justify this notion with a few results.

Clifford algebras, Fock modules and projective 2-representations of quadratic vector spaces

Domenico FIORENZA

Sapienza Università di Roma, Italy

Abstract: As recently illustrated by Ludewig and Roos, second quantization of fermions, i.e., the algebraic construction associating with a quadratic vector space its Clifford algebra and to a Lagrangian relation its exterior algebra (the Fock module) is an anomalous functor with values in the 2-category of algebras, bimodules and bimodule morphisms, with anomaly given by determinant lines. This can be equivalently seen as a projective 2-representation of the category of Lagrangian relations. By analogy to what happens with projective representations of groups, this suggests that suitable 2-central extensions of the category of Lagrangian relations should lift this projective 2-representation to an actual, i.e., non-anomalous, 2-representation. This makes the generalized Lagrangian relations considered by Stolz and Teichner naturally appear. Based on joint work in progress with Chetan Vuppulury.

0-dimensional ideal approximation theory

扶先辉 Xianhui FU

中国 东北师范大学 Northeast Normal University, China

Abstract: Ideal torsion pairs $(\mathcal{I}, \mathcal{J})$ are considered in the context of an additive category \mathcal{A} , and weak kernels and weak cokernels are used to introduce the notion of a Hom-special approximating ideal. A 0-dimensional version of Salce's Lemma says that \mathcal{I} is Hom-special precovering if and only if \mathcal{J} is Hom-special preenveloping. Such an ideal torsion pair is called complete. The notion of extension $\mathcal{J}_2 \diamond \mathcal{J}_1$ of ideals is introduced and conditions are investigated under which it is the ideal Hom-orthogonal to the product ideal $\mathcal{I}_1\mathcal{I}_2$, for two complete ideal torsion pairs $(\mathcal{I}_1, \mathcal{J}_1)$ and $(\mathcal{I}_2, \mathcal{J}_2)$. Together with the sum, the intersection, and the product, these are the four operations on ideals.

The notion of weak exact category is introduced, and a 0-dimensional version of Christensen's Lemma states that if $(\mathcal{I}_1, \mathcal{J}_1)$ and $(\mathcal{I}_2, \mathcal{J}_2)$ are two complete ideal torsion pairs in a weak exact category, then $(\mathcal{I}_1\mathcal{I}_2, \mathcal{J}_2 \diamond \mathcal{J}_1)$ and $(\mathcal{I}_1 \diamond \mathcal{I}_2, \mathcal{J}_2\mathcal{J}_1)$ are complete ideal torsion pairs.

When \mathcal{A} is an abelian category, it is shown that there is a bijective correspondence between complete ideal torsion pairs in \mathcal{A} and preradicals of \mathcal{A} , and we consider a condition - image maximality - on the ideal \mathcal{I} that ensures it generates a complete ideal torsion pair. If $(\mathcal{A}; \mathcal{E})$ is a Frobenius exact category, the triangulated structure of the stable category $\underline{\mathcal{A}}$ of \mathcal{A} is used to show that an ideal cotorsion pair $(\mathcal{I}, \mathcal{J})$ in $(\mathcal{A}; \mathcal{E})$ is complete if and only if the corresponding ideal torsion pair $(\pi(\mathcal{I}), \pi(\Sigma(\mathcal{J})))$ of quotient ideals \mathcal{I} .

G -semisimple algebras

Rasool HAFEZI

中国 南京信息工程大学 Nanjing University of Information Science & Technology, China

Abstract: In my lecture, I will introduce the concept of G -semisimple algebras, which encompass several important categories, including gentle algebras. We will begin by discussing the basic properties of G -semisimple algebras. Furthermore, I will explore the subcategory of Gorenstein projective representations $\text{Gprj}(\mathcal{Q}, \Lambda)$ of an acyclic quiver \mathcal{Q} over a G -semisimple algebra Λ . I will establish an equivalence between the stable category of $\text{Gprj}(\mathcal{Q}, \Lambda)$ and $\text{rep}(\mathcal{Q}, \underline{\text{Gprj}}\text{-}\Lambda)$, where the latter denotes the category of representations of \mathcal{Q} over the stable category $\underline{\text{Gprj}}\text{-}\Lambda$. In particular, I will focus on the case where the quiver is of type A_n . During this discussion, I will establish a fascinating periodicity phenomenon in terms of n within the stable Auslander-Reiten quiver of the subcategory of Gorenstein projective representations over A_n .

An introduction to Shephard-Todd-Chevalley Theorem for finite group (Hopf algebra) actions on AS-regular algebras

何济位 Jiwei HE

中国 杭州师范大学 Hangzhou Normal University, China

Abstract: The classical Shephard-Todd-Chevalley Theorem says that for a finite group G acting faithfully on a polynomial algebra A , then the invariant subalgebra A^G is of finite global dimension if and only if G is generated by pseudo-reflections. In this talk, I will report some progresses on noncommutative version of Shephard-Todd-Chevalley Theorem.

Resolutions of quadratic algebras

Stanislas HERSCOVICH

Université Grenoble Alpes, France

Abstract: In this talk we will introduce the notion of a resolving datum, which allows to construct projective resolutions for quadratic algebras (and, more generally, homogeneous algebras). We also give sufficient conditions for the projective resolution to be minimal, and remark that all of the quadratic algebras we have seen in the literature (and for which the cohomology was computed) have a resolving datum and our projective resolution is minimal: the only exception we know so far is the Fomin-Kirillov algebra of index 4, for which we proved it has a resolving datum but the corresponding projective

resolution is not minimal. We used this projective resolution to compute in GAP the dimensions of the corresponding first cohomology groups. This is a joint work with Ziling Li.

The stable functor and its applications

胡维 Wei HU

中国 北京师范大学 Beijing Normal University, China

Abstract: The stable functor of a derived equivalence was introduced by Hu and Xi in 2010. Later, Hu and Pan gave a general definition of stable functors of non-negative functors between derived categories which may not be derived equivalences, and proved that the stable functor of a derived equivalence always induces a triangle equivalence between the stable categories of Gorenstein projective modules. In this talk, we shall discuss the behavior of several homological conjectures under derived equivalences or singular equivalences induced by stable functors.

d -hearts in triangulated categories

晋海波 Haibo JIN

Universität zu Köln, Germany

Abstract: In this talk, we introduce the notion of d -hearts, which is a finite analogue of hearts of bounded t -structures, and it can be regarded as a counterpart of d -cluster tilting subcategories in negative Calabi-Yau triangulated categories and as a generalization of simple-minded systems. As an analogue of classical result due to Beilinson-Bernstein-Deligne, we show that d -hearts are abelian categories for $d \geq 3$. Using bounded t -structures, we construct d -hearts by using shifted Serre functors. This is a joint work in progress with Osamu Iyama.

Gorenstein algebras from ice quivers with potential

Bernhard KELLER

Université Paris Cité, France

Abstract: We will explain how to associate Gorenstein algebras to certain ice quivers with potential and how to describe their Gorenstein projective modules. This is a report on work by Yilin Wu and recent joint work with him.

Higher Auslander-Gorenstein algebras and Gabriel topologies

Mohammad KESHAVARZ

中国 南通大学 Nantong University, China

Abstract: This paper is devoted to study the relationship between two important notions in ring theory, category theory, and representation theory of Artin algebras; namely, Gabriel topologies and higher Auslander(-Gorenstein) algebras.

We first show that the class of all torsionless modules over higher Auslander(-Gorenstein) algebras is a torsion-free class of a hereditary torsion theory. Then we give a description of the class of all corresponding torsion-free divisible modules and show that higher Auslander(-Gorenstein) algebras can be characterized by a special Gabriel topology.

Among some applications, the results also reveal a relation between the projective dimension of a module and the projective dimensions of the annihilator ideals of its objects over higher Auslander algebras.

This is a joint work with Guodong Zhou.

Bifurcation-splittings of graphs and Leavitt path algebras

李换换 Huanhuan LI

中国 安徽大学 Anhui University, China

Abstract: For a given graph E and a bifurcation vertex v in E , we construct the new graph $E[v]$ which is called a bifurcation-splitting of E . We establish an injective homomorphism between the two Leavitt path algebras over a field K (as Z -graded algebras). We also give a combinatorics sufficient and necessary condition for this homomorphism to be an isomorphism of Z -graded algebras. It turns out that these two Leavitt path algebras are Z -graded isomorphic if and only if this homomorphism is an isomorphism as Z -graded algebras. This is a joint work with Y. Q. Wen and J. Le.

Sheaves of modules over left rooted EI categories

李利平 Liping LI

中国 湖南师范大学 Hunan Normal University, China

Abstract: Grothendieck and Verdier pointed out that every Grothendieck topology on a finite category is a subcategory topology. Consequently, categories of sheaves of modules over finite ringed sites are equivalent to categories of presheaves of modules. In this talk we describe a generalization of these

results to categories \mathcal{C} satisfying the following conditions: every endomorphism in \mathcal{C} is an isomorphism, and the underlying poset of \mathcal{C} is artinian.

A generalization of Dugas' construction on stable auto-equivalences for symmetric algebras

刘玉明 Yuming LIU

中国 北京师范大学 Beijing Normal University, China

Abstract: In 2015, Dugas gave two methods to construct nontrivial auto-equivalences of stable module categories for elementary, local symmetric algebras over a field k . These auto-equivalences are modeled after the spherical twists of Seidel and Thomas and the P_n -twists of Huybrechts and Thomas, which yield auto-equivalences of the derived category of coherent sheaves on a variety. We give a unified generalization of Dugas' construction for arbitrary symmetric algebras. This is a joint work with Nengqun Li.

Hochschild cohomology for functors on linear symmetric monoidal categories

Nadia ROMERO

Universidad de Guanajuato, Mexico

Abstract: Let \mathcal{X} be an essentially small symmetric monoidal category enriched in $R\text{-Mod}$, with R a commutative ring with identity. Under these conditions, the category \mathcal{F} , of R -linear functors from \mathcal{X} to $R\text{-Mod}$, becomes an abelian symmetric monoidal category, also enriched in $R\text{-Mod}$. The fact that \mathcal{F} is monomial and abelian at the same time allows for a nice theory of modules over the monoids in \mathcal{F} , in particular it allows for a nice and easy definition of an internal hom functor. In this talk, we will see how this internal hom is the key to define a Hochschild cohomology theory in \mathcal{F} .

Hearts of set-generated t -structures have a set of generators

Manuel SAORIN

Universidad de Murcia, Spain

Abstract: A popular problem in recent times has been to give conditions that guarantee that a given t -structure in a triangulated category with coproducts has a Grothendieck heart. The problem essentially divides in two “disconnected” parts, namely, to check when that heart is AB5 (i.e. has exact direct

limits) on one side and check when it has a set of generators on the other. This second part has been normally tackled by assuming some model for the ambient triangulated category, e.g. being the homotopy category of some model category, some stable ∞ -category or the base of a strong stable derivator.

Based on recent results of Neeman, we will show in this talk that one can get rid of the existence of such a model, assuming instead that the triangulated category is well-generated, a condition that is satisfied by essentially all examples appearing in practice. Our main result claims that in such an ambient category any t -structure generated by a set of objects has a heart with a set of generators.

The Hochschild cohomology ring of monomial path algebras

Andrea SOLOTAR

Universidad de Buenos Aires, Argentina

Abstract: The aim of the talk is to prove that the cup product is trivial in positive degrees for triangular monomial path algebras. For this, we give an explicit description of a diagonal map on the Bardzell resolution for any monomial path algebra, and we use this diagonal map to describe the cup product on Hochschild cohomology. Our proof does not rely on explicit computations of the Hochschild cohomology modules.

This is a joint work with Dalia Artenstein, Janina Letz and Amrei Oswald.

Deformation theory of Rota-Baxter algebras

王凯 Kai WANG

中国 华东师范大学 East China Normal University, China

Abstract: The concept of Rota-Baxter algebra was introduced by G. Baxter and G. C. Rota in the 1960s. Today, this concept is closely linked to various topics such as renormalization theory, the Yang-Baxter equation, operad theory, and more. In this talk, we will explore the deformation theory of Rota-Baxter algebras. We will introduce an L_∞ algebra to govern the deformation theory of Rota-Baxter algebras. By solving the Maurer-Cartan equation in this L_∞ algebra, we will naturally derive the concept of homotopy Rota-Baxters. Moreover, we will observe that the operad of our homotopy Rota-Baxter algebras is precisely the minimal model of the Rota-Baxter operad.

Sincere modules and the vanishing condition

魏加群 Jiaqun WEI

中国 南京师范大学 Nanjing Normal University, China

Abstract: We study the relation between sincere modules and the vanishing condition appeared in the characterization of classical tilting modules in perfect rings. As an application, we give a characterization of sincere silting modules and a new proof of a theorem of Xiaojin Zhang. This is a joint work with Jifen Liu.

Irreducible representations and discriminant ideals over some module-finite algebras

吴泉水 Quanshui WU

中国 复旦大学 Fudan University, China

Abstract: Discriminants of noncommutative algebras have been intensely studied in recent years and many methods have been developed. A sequence of discriminant ideals (or more generally, modified discriminant ideals) can be defined for more general algebras by using trace functions. A deep relation between the zero sets of the (modified) discriminant ideals of an algebra and the dimensions of its irreducible modules was given by Brown-Yakimov. Brown-Yakimov also proved that: if A is a maximal order, or a Cayley-Hamilton algebra, the complement in the maximal spectrum of the zero set of the highest discriminant ideal is precisely the Azumaya locus of A . In a recent work, Mi-Yakimov provided a description of the zero sets of the lowest discriminant ideals of Cayley-Hamilton Hopf algebras. The talk will start from some basic definitions and the property of irreducible modules over module-finite algebras, then introduce some results of Mi-Wu-Yakimov.

(Relative) AGK's constructions and Higgs constructions

吴燚林 Yilin WU

中国 中国科学技术大学 University of Science and Technology of China, China

Abstract: We study two kinds of reduction process of triangulated categories, that is, silting reduction and (relative) AGK's constructions. Let \mathcal{T} be a triangulated category. It is shown that we have the following equality

AGK's construction of (silting reduction of \mathcal{T}) = silting reduction of (relative AGK's construction of \mathcal{T}).

Examples include the construction of relative cluster categories and Higgs categories, and the category of Cohen-Macaulay modules over a local complete noetherian Gorenstein k -algebra with an isolated singularity.

Equivalence relations VS derived equivalences

惠昌常 Changchang XI

中国 首都师范大学 Capital Normal University, China

Abstract: As is known, Morita, derived and stable equivalences are three of fundamental equivalences of algebras in the representation theory of algebras and groups. In this talk, we investigate these three equivalences for the centralizers of matrices. This class of algebras appears in many aspects of mathematics. For example, in geometry variety, Markov process, and invariant theory. A centralizer of a matrix in a full matrix algebra is termed a principle centralizer matrix algebra. We introduce new equivalence relations on square matrices in terms of elementary divisors of matrices, and reduce the description of Morita, derived and stable equivalences of Morita type for principal centralizer matrix algebras to problems in linear algebra. The contents of the talk report a recent work with Xiaogang Li, see arXiv:2312.0879.

On cohomological characterizations of endotrivial modules

徐斐 Fei XU

中国 汕头大学 Shantou University, China

Abstract: Given a general finite group G , there are various finite categories whose cohomology theories are of great interests. Recently Balmer and Grodal gave some new characterizations of the groups of endotrivial modules, via Čech cohomology and category cohomology, respectively, defined on certain orbit categories. These two seemingly different approaches share a common root in topos theory. We shall demonstrate the connection, which leads to a better understanding as well as new characterizations of the group of endotrivial modules.

Model structure from one cotorsion pair

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Abstract: In contrast with the Hovey correspondence of abelian model structures, from two complete cotorsion pairs, Beligiannis and Reiten give a construction of model structures on abelian categories, from only one complete cotorsion pair. The aim of this talk is to extend this result to weakly idempotent complete exact categories, by adding the condition of heredity of the complete cotorsion pair. In fact, even for abelian categories, this condition of heredity should be added. This construction really gives model structures which are not necessarily exact in the sense of Gillespie. The correspondence of

Beligiannis and Reiten of weakly projective model structures also holds for weakly idempotent complete exact categories.

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