Homological Trends in Representation Theory

March 20-23, 2026, USTC, Hefei

Mar. 20 (Friday)		
Time	**Chair**	**Talk**
12:00-18:00		**Arrival**

Mar. 21 (Saturday)		
Time	**Chair**	**Talk**
8:40-9:20	Henning Krause	Fei Xu (Shantou University)
9:25-10:05		Ming Lu (Sichuan University)
10:05-10:35	**Tea Break + Group Photo**	
10:35-11:15	Lingling Yao	Xiaojin Zhang (Jiangsu Normal University)
11:20-12:00		Yu Zhou (Beijing Normal University)
12:00-14:00	**Lunch Break**	
14:00-14:40	Shengfei Geng	Jianmin Chen (Xiamen University)
14:45-15:25		Zhengfang Wang (Nanjing University)
15:25-15:40	**Tea Break**	
15:40-16:20	Jian Liu	Shiquan Ruan (Xiamen University)
16:25-17:05		Chao Zhang (Guizhou University)
17:05-17:20	**Tea Break**	

17:20-18:00	Huanhuan Li	Hongxing Chen (Capital Normal University)
18:00-20:00	**Dinner**	

Mar. 22 (Sunday)		
Time	**Chair**	**Talk**
8:40-9:20	Jie Li	Nan Gao (Shanghai University)
9:25-10:05		Zhe Han (Henan University)
10:05-10:25	**Tea Break**	
10:25-11:05	Zhibing Zhao	Zhi-Wei Li (Jiangsu Normal University)
11:10-11:50		Guodong Zhou (East China Normal University)
12:00-14:00	**Lunch Break**	
14:00-17:00	**Free Discussion**	

Information		
Lecture Room	**Mar. 21**	5th Teaching Building 5107, with Tea Break/Discussion Room at 5106
	Mar. 22	5th Teaching Building 5307, with Tea Break/Discussion Room at 5305
Lunch/Dinner	Guesthouse buffet, the 2nd floor	
Organizers	Peigen Cao (USTC), Xiao-Wu Chen (USTC), Henning Krause (Bielefeld Univ.), Kai Wang (USTC), Yu Ye (USTC)	
Sponsors	NNSF of China, National Key R&D Program of China, School of Math. Sci. USTC	

Abstracts

Virtually Gorenstein algebras of infinite dominant dimension

Hongxing Chen (Capital Normal University)

Abstract: We investigate a very central question in the representation theory of algebras: Under what conditions does a self-orthogonal generator-cogenerator over an algebra become projective? This is closely related to the Nakayama conjecture. In this talk, we focus on modules whose endomorphism algebras are virtually Gorenstein and impose an additional orthogonality condition involving the Nakayama functor. In particular, we show that if an algebra has infinite dominant dimension and satisfies certain Ext-vanishing conditions, then being virtually Gorenstein forces the algebra to be self-injective. Our proof is based on an amazing characterization of virtually Gorenstein algebras established by A. Beligiannis and H. Krause (2008). This talk reports a joint work with Changchang Xi.

Combinatorial approaches to exceptional sequences for weighted projective lines of type (p, q)

Jianmin Chen (Xiamen University)

Abstract: In this talk, we provide a combinatorial description of morphisms in the coherent sheaf category over weighted projective line of type (p, q), which enables a geometric realization of exceptional sequences in the coherent sheaf category. As applications, a classification of complete exceptional sequences, an effective method for enlarging exceptional sequences and a combinatorial description of tilting bundles are obtained. Consequently, the number of tilting bundles up to the Auslander-Reiten translation is given. This is a joint work with Yiting Zheng.

Weakly Gorensteinness of tensor algebras and Morita algebras

Nan Gao (Shanghai University)

Abstract: An algebra A is left weakly Gorenstein if any semi-Gorenstein-projective left A-modules is Gorenstein-projective. The weakly Gorensteinness of two kinds of algebras is established, using the method of the monomorphism category. This is based on the joint work with Pu Zhang and Shijie Zhu.

Cluster braid groups of Coxeter-Dynkin diagrams

Zhe Han (Henan University)

Abstract: Cluster exchange groupoids are introduced by King-Qiu as an enhancement of cluster exchange graphs to study the topology of the moduli space of stability conditions and quadratic differentials. Cluster braid group is the fundamental group of a cluster exchange groupoid viewed as 2-cell complex. In this talk, I will introduce the cluster exchange groupoid for any finite Coxeter-Dynkin diagram and show that their cluster braid groups are isomorphic to the corresponding braid groups. This is a joint work with He Ping and Qiu Yu.

The Grothendieck group of a triangulated category

Zhi-Wei Li (Jiangsu Normal University)

Abstract: We give a direct proof of the following known result: the Grothendieck group of a triangulated category with a silting subcategory is isomorphic to the split Grothendieck group of the silting subcategory. Moreover, we obtain its cluster-tilting analogue. This is joint work with Xiao-Wu Chen, Xiaojin Zhang, and Zhibing Zhao.

Hall-Lie algebra realization of GIM Lie algebras

Ming Lu (Sichuan University)

Abstract: Generalized intersection matrix (GIM) Lie algebras are introduced by Slodowy in 1986, as a generalization of Kac-Moody Lie algebras. In this talk, we shall consider singularity categories of some 1-Gorenstein quiver algebras, and construct their Hall-Lie algebras. The Hall-Lie algebras are proved to be isomorphic to the corresponding GIM Lie algebras. This result generalizes the realization of Kac-Moody Lie algebras by Peng-Xiao. It is based on an ongoing joint work with Changjian Fu and Zhanhong Liang.

From vector bundles to preprojective algebras

Shiquan Ruan (Xiamen University)

Abstract: In this talk, we will introduce new exact structures on the category of vector bundles over a weighted projective line, and establish deep connections between the category of vector bundles with monomorphism category, the category of maximal Cohen-Macaulay modules, and also the module category of preprojective algebras.

Tensor products arising from brace B-infinity algebras

Zhengfang Wang (Nanjing University)

Abstract: In 2008, Benson and Krause constructed a tensor product on the (perfect) derived category of its Koszul dual of a finite p-group G, using the classifying space of G. They further showed that, under Koszul duality, this tensor product corresponds to the ordinary tensor product on the (bounded) derived category of G. This confirmed a conjecture of Krause from 2004.

Motivated by this, we construct a tensor product on the derived category of right A-infinity modules over an A-infinity algebra A under the additional

assumption that A is a brace B-infinity algebra. As an application, we recover the tensor product on the derived category of the Koszul dual of a p-group. This work is based on the PhD thesis of Mengdie Zhang, jointly supervised by Gongxiang Liu.

Modulated categories and their representations

Fei Xu (Shantou University)

Abstract: As a by-product to understand 2-representations of finite categories, the notion of a modulated category generalizes the concepts of a modulated quiver and of a presheaf of algebras. We explain the basic ideas, and then demonstrate how to use a 2-limit to handle the representations of a modulated category.

On the representation type of subcategories of derived category

Chao Zhang (Guizhou University)

Abstract: In this talk, we mainly introduce the representation type of subcategories of the bounded derived category. We define the representation type and some homological invariants including cohomological length, width, range for subcategories. For finite-dimensional algebras, we establish the first Brauer-Thrall type theorem of certain contravariantly finite subcategories.

Self-orthogonal τ-tilting modules and tilting modules

Xiaojin Zhang (Jiangsu Normal University)

Abstract: In this talk, we talk about self-orthogonal τ-tilting modules and tilting modules. We show that self-orthogonal τ-tilting modules with finite projective dimension are tilting modules. We also show that a self-orthogonal τ-tilting module T is a tilting module if the endomorphism algebra $\mathrm{End}\,T$ has finite global delooping level. As a result, we can get that over several classes of algebras

self-orthogonal τ-tilting modules are tilting modules. This talk based a joint work with X.W Chen, Z. W. Li and Z.B. Zhao [CLZZ 2025] and a paper of mine [Z 2022].

Yoneda Ext-groups of generalised twisted tensor products

Guodong Zhou (East China Normal University)

Abstract: We consider Yoneda Ext algebras over generalised twisted tensor products which generalise smash products of a Hopf algebra and a module algebra, Tacheuchi smash product of a module algebra and a comodule algebra etc. Under a rigidity condition and some mild finiteness conditions, we show that the Ext algebra of a generalised twisted tensor product of two algebras is isomorphic to the twisted tensor product of the Yoneda Ext algebras of these two algebras. This talk is based on a joint work with Hongguang Nie, Chaoyuan Zhou and Ruipeng Zhu.

Higher analogues of classical structures in extended module categories

Yu Zhou (Beijing Normal University)

Abstract: The representation theory of finite-dimensional algebras is built upon various interconnected concepts, such as tilting modules, torsion pairs, semibricks, and wide subcategories. In this talk, we extend these notions to a higher setting using the framework of extended module categories. We will demonstrate how classical relationships between these structures are preserved in this context, while also highlighting the novel phenomena and changes that arise in the higher setting.