Mini-Workshop on Algebras and Representation Theory

邀请报告人：

鲍炎红（安徽大学）

高汉鹏（安徽大学）

高楠（上海大学）

李换换（安徽大学）

李杰（合肥工业大学）

吕为国（中国科学技术大学）

章超（贵州大学）

赵志兵（安徽大学）

会议时间/地点：2022 年 1 月 1-2 日，管理科研楼 1318

会议组织者：陈小伍，乐珏，Bernhard Keller，叶郁

会议资助：基金委，数学科学学院，吴文俊实验室

日程见网址：
http://home.ustc.edu.cn/~xwchen/Workshops%20and%20conferences%20NEW.htm

Mini-Workshop on Algebras and Representation Theory

January 1-2, 2021, USTC, Hefei

Jan. 1 (Saturday)

Time	Chair	Talk
9:00-12:00		Arrival
12:00-14:30		Break
14:30-15:20	Bernhard Keller	Chao Zhang 章超 （贵州大学）
15:25-16:15		Hanpeng Gao 高汉鹏 （安徽大学）
16:15-16:35		Tea Break+Group Photo
16:35-17:25		Huanhuan Li 李换换 （安徽大学）

Jan. 2 (Sunday)

Time	Chair	Talk
9:00-9:50	Yanhong Bao	Nan Gao 高楠 （上海大学）
9:55-10:45		Weiguo Lyu 吕为国 （中国科学技术大学）
10:45-11:05		Tea Break
11:05-11:55		Zhibing Zhao 赵志兵 （安徽大学）
11:55-14:00		Break
14:00-14:50	Yu Ye	Jie Li 李杰（合肥工业大学）
14:50-15:10		Tea Break
15:10-16:00		Yanhong Bao 鲍炎红 （安徽大学）
16:00-17:30		Free discussion/Departure

Lecture Room: 管理科研楼 1318

组织者：陈小伍，Bernhard Keller，乐珏，叶郁

Abstracts

Yanhong Bao, Quotients of the associative algebra operad of GK-dimension five

Abstract: Let $\mathcal{A}ss$ denote the associative algebra operad that encodes the category of unital associative algebras. Quotient operads of $\mathcal{A}ss$ relate to polynomial identity algebras (PI-algebras) closely. In fact, a PI-algebra is equivalent to an algebra over $\mathcal{A}ss/\mathcal{I}$ for some nonzero operadic ideal of $\mathcal{A}ss/\mathcal{I}$. In this talk, we will introduce the classification of quotient operads $\mathcal{A}ss/\mathcal{I}$ of GK-dimension 5.

Hanpeng Gao, Wide tau-tilting modules and epibricks

Abstract: As a generalization of support tau-tilting modules, H. Enomoto introduced the notion of wide tau-tilting modules and establish a bijection between wide tau-tilting modules and doubly functorially finite ICE-closed subcategories, which extends Adachi-Iyama-Reiten's bijection on torsion classes. In this talk, we consider the relationship between wide tau-tilting modules and some sets of bricks (named epibricks). In particular, we show that there is a bijection between wide tau-tilting modules and epibricks for Nakayama algebras. As a consequence, we get a recurrence relation for the number of wide tau-tilting modules over Nakayama algebras.

Nan Gao, Relative rigid modules and Gorenstein silting modules

Abstract: In the paper, we introduce the relative rigid module for an algebra of finite CM-type, and the Gorenstein silting module for a Noetherian ringwith the property that the category of Gorenstein-projective modules being contravariantly finite. We show the above two classes of modules coincide with each other for algebras of finite CM-type. We also show the connection with the Gorenstein tilting module and the Gorenstein star module.

Huanhuan Li, Representations for Steinberg algebras

Abstract: We recall the notion of the Steinberg algebra of an ample Hausdorff groupoid. We study the category of left graded modules over the Steinberg algebra. Specialising our results to the trivial grading, we obtain (irreducible) representations of (ungraded) Steinberg algebras.

Jie Li, Piecewise hereditary algebras under field extensions

Abstract: Let A be a finite-dimensional k-algebra and K/k be a finite separable field extension. In this talk we consider the piecewise hereditary property of A under base field extension. We prove that A is derived equivalent to a hereditary algebra if and only if so is A$\otimes_k$K.

Weiguo Lyu, Nonsymmetric operads and various structures over cohomology theories

Abstract: We investigate how nonsymmetric operads with additional structures give rise to various structures over the corresponding cohomology groups and complexes. We show that the normalised cohomological complex of a nonsymmetric cyclic operad with multiplication is a Quesney homotopy BV algebra; as a consequence the cohomology groups form a BV algebra, which is a result due to L. Menichi in 2004. We define cyclic opposite operad modules with pairing and show that the existence of such cyclic opposite operad module with pairing implies that the operad is a cyclic operad and hence its cohomological complex is a Quesney homotopy BV algebra, continuing a line of research beginning by N. Kowalzig et al.. We also give the definitions of GV modules and quasi differential calculus. At last, we apply our results to hom-associative algebras.

Chao Zhang, The dichotomy theorems on the representation type of the derived category of algebras

Abstract: In this talk, the representation type related to derived category will be introduced. The notation of C-dichotomy is introduced base on the dichotomy property of the representation type on complex category, which implies the dichotomy property of representation type on the level of homotopy category and derived category. The main theorem of the talk is that, if the base field k of a finite dimensional algebra A admits a finite separable extension K/k such that K is algebraically closed, then A is C-dichotomic. In particular, the second derived Brauer-Thrall type theorem holds for the finite-dimensional algebra over the real number field. This is a joint work with Li Jie.

Zhibing Zhao, Some homological invariant properties under Frobenius extensions

Abstract: Let A/S be an extension of rings. If A_S is a finitely generated S-module and $\text{Hom}_S(_A A_S, _S S_S)$ isomorphic to $_S A_A$ as S-A- bimodules, then A/S is called a Frobenius extension. In this paper, we obtain some homological invariant properties under Frobenius extensions.