第四届代数与表示论前沿进展研讨会

会议手册

2022 年 7 月 5 日

目 录

会议举办单位：

首都师范大学 数学科学学院

会议组织者：

惠昌常(首都师范大学)

陈红星(首都师范大学)

刘玉明(北京师范大学)

胡　维(北京师范大学)

学术报告（线上）：

腾讯会议 APP　　会议 ID: 124 184 290　会议密码：202207

会议链接：　https://meeting.tencent.com/dm/VZFczFjoOI9D

会议联系人：

惠昌常：xicc@cnu.edu.cn

陈红星：chenhx@cnu.edu.cn

一、日 程 表

日期	时间	事项	主持人
7月5日	08:50-9:00	开幕式	惠昌常
	9:00-9:50	**From recollements of abelian categories to recollements of triangulated categories** 朱海燕（浙江工业大学）	
	10:00-10:50	**Abelian model structures on the categories of representations over diagrams of abelian categories** 狄振兴（西北师范大学）	胡　维
	11:00-11:50	**The derived-discrete algebras over the real numbers** 李杰（合肥工业大学）	
	休息		
	14:00-14:50	**On τ-rigid modules over gentle algebras** 耿圣飞（四川大学）	刘玉明
	15:00-15:50	**Higher-dimensional Auslander-Reiten theory** 周潘岳（湖南理工学院）	
	休息		
	16:10-17:00	**Hall algebras of extriangulated categories and quantum cluster algebras** 张海诚（南京师范大学）	陈红星
	17:10-18:00	**Gluing of derived equivalences of dg categories** 潘升勇（北京交通大学）	

二、报告题目与摘要

From recollements of abelian categories to recollements of triangulated categories

朱海燕（浙江工业大学）

In this paper, we first provide an explicit procedure to glue complete hereditary cotorsion pairs along the recollement A,C,B of abelian categories with enough projective and injective objects. In combination with a result due to Gillespie, we establish recollements of triangulated categories from recollements of abelian categories by using the theory of exact model structures. Finally, we give applications to contraderived categories, projective stable derived categories and stable categories of Gorenstein injective modules over an upper triangular matrix ring.

Abelian model structures on the categories of representations over diagrams of abelian categories

狄振兴（西北师范大学）

A diagram of abelian categories is a family of abelian categories glued by an index category. The central theme of our work is to determine whether local properties shared by all abelian categories of a diagram of abelian categories can be amalgamated to the corresponded global properties of the representation category over the diagram. We investigate the structure of the representation category, construct important functors and establish adjunction relations between them. As applications, we study the “global” cotorsion theory in the representation category induced by “local” cotorsion theories in each abelian category, and construct abelian model structures on the representation category for some special index categories. This is a joint work with Liping Li, Li Liang, and Nina Yu.

The derived-discrete algebras over the real numbers

李杰（合肥工业大学）

We classify derived-discrete algebras over the real numbers up to Morita equivalence, using the classification of complex derived-discrete algebras by D. Vossieck in “The algebras with discrete derived category”. To this end, we investigate the quiver presentation of the complexified algebra of a real algebra given by a modulated quiver and an admissible ideal.

On τ-rigid modules over gentle algebras

耿圣飞（四川大学）

Let A be a gentle algebra. In this talk, we prove that the τ-rigid A-modules are determined by their dimension vectors if and only if A has no even oriented cycle with full relations. As a byproduct, we show that the Fomin-Zelevinsky denominator conjecture holds for cluster algebras of type A, B and C, different cluster monomials have different dimension vectors with respect to any initial seeds. This talk is based on joint work with Changjian Fu.

Hall algebras of extriangulated categories and quantum cluster algebras

张海诚（南京师范大学）

In this talk, we will recall the definitions of Hall algebras, including those of abelian categories, exact categories and triangulated categories. Then we give the definition of Hall algebras for extriangulated categories. As an application, we consider the Hall algebra of an extriangulated subcategory of the bounded derived category of a hereditary algebra, and relate it with quantum cluster algebras. This talk is based on my joint papers arXiv:2107.05883, 2005.10617 and 2108.03558.

Higher-dimensional Auslander-Reiten theory

周潘岳（湖南理工学院）

In this talk, we mainly focus on the higher-dimensional Auslander-Reiten theory in a (d+2)-angulated category. We first discuss the existence of Auslander-Reiten (d+2)-angles in (d+2)-angulated categories. Afterwards, we establish a relation between Serre functors and Auslander-Reiten (d+2)-angles, and give some applications. Finally, we study the relation between Grothendieck groups and Auslander-Reiten (d+2)-angles.

Gluing of derived equivalences of dg categories

潘升勇（北京交通大学）

A diagram consisting of differential graded categories and dg functors is formutated as a colax functor X from a small category I to the 2-category DGkCat of dg categories, dg functors and dg natural transformations for a fixed commutative ring k. The dg categories X(i) with i objects of I can be glued together to have a single dg category Gr(X), called the Grothendieck construction of X. In this talk, we consider colax functors X and X' from I to DGkCat such that X(i) and X'(i) are derived equivalent for all objects i of I, and give a way to glue these derived equivalences together and a sufficient condition for this gluing to be a derived equivalence between their Grothendieck constructions Gr(X) and Gr(X').This is joint work with Hideto Asashiba.