CONTEMPORARY MATHEMATICS

769

Representations of Algebras, Geometry and Physics

Maurice Auslander Distinguished Lectures
and International Conference
April 25–30, 2018
Woods Hole Oceanographic Institute
Woods Hole, MA

Kiyoshi Igusa
Alex Martsinkovsky
Gordana Todorov
Editors

AMS American Mathematical Society

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Contents

Preface vii

Examples of geodesic ghor algebras on hyperbolic surfaces
Karin Baur and Charlie Beil 1

Feynman categories and representation theory
Ralph M. Kaufmann 11

Preprojective roots and graph monoids of Coxeter groups
Mark Kleiner 85

Approximable triangulated categories
Amnon Neeman 111

Methods of constructive category theory
Sebastian Posur 157

The HRS tilting process and Grothendieck hearts of t-structures
Carlos E. Parra and Manuel Saorín 209

Preface

This volume of expository lectures is an outgrowth of the annual Maurice Auslander Distinguished Lectures and International Conference that took place April 25 - 30, 2018 at the Woods Hole Oceanographic Institute in Woods Hole, MA.

The continued – and gratefully acknowledged – support from the National Science Foundation and Bernice Auslander results in a combination of established experts and a large number of graduate students and young researchers attending the conference. Their interest and unabating enthusiasm is *raison d'être* for this series of expository works (for the previous collections, see Contemporary Mathematics, vols. 607, 673, and 716).

The selected expository lectures in this volume cover a rather wide area of research. Karin Baur and Charlie Beil introduce a new class of quiver algebras called geodesic ghor algebras which, unlike dimer algebras, exhibit good behavior on surfaces of higher genus. Ralph Kaufmann's detailed paper deals with algebraic aspects of Feynman categories, a subject that has found applications in algebra, category theory, geometry, number theory and physics. An intriguing connection between representations of quivers and Coxeter groups is discussed in Mark Kleiner's contribution. Amnon Neeman surveys the relatively new concept of approximable triangulated categories that leads to new powerful results. The question of when the heart of a t-structure is a Grothendieck category is dealt with by Carlos E. Parra and Manuel Saorín. Sebastian Posur introduces the reader to methods of constructive category theory by describing two computational examples. One deals with natural transformations between finitely presented functors and the other – with the differentials on the pages of a spectral sequence.

As we mentioned before, the primary audience for this volume are graduate students and young researchers working in and around representation theory. We believe, however, that this multifaceted volume may be of interest to a much wider audience.

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Representations, Geometry and Physics • Igusa et al., Editors

This volume contains selected expository lectures delivered at the 2018 Maurice Auslander Distinguished Lectures and International Conference, held April 25–30, 2018, at the Woods Hole Oceanographic Institute, Woods Hole, MA.

Reflecting recent developments in modern representation theory of algebras, the selected topics include an introduction to a new class of quiver algebras on surfaces, called "geodesic ghor algebras", a detailed presentation of Feynman categories from a representation-theoretic viewpoint, connections between representations of quivers and the structure theory of Coxeter groups, powerful new applications of approximable triangulated categories, new results on the heart of a t-structure, and an introduction to methods of constructive category theory.

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