

# CONTEMPORARY MATHEMATICS

728

## Tensor Categories and Hopf Algebras

Scientific Session of the  
Mathematical Congress of the Americas  
Hopf Algebras and Tensor Categories  
July 27–28, 2017  
Montreal, Canada

Nicolás Andruskiewitsch  
Dmitri Nikshych  
Editors

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## Preface

The scientific session “Hopf algebras and tensor categories” was held at the McGill University in Montreal (Canada) on July 27-28, 2017 as a part of the Mathematical Congress of the Americas. The session consisted of 15 talks by researchers from six different countries. The list of speakers and abstracts of the talks can be found online at <https://mca2017.org/prog/session/hat>.

Many important advances in the theory of tensor categories are motivated by the theory of Hopf algebras and, conversely, categorical methods play an increasingly important role in Hopf algebra studies. The recent achievements in the classification of pointed Hopf algebras and fusion categories further stimulate a cross-fertilization between these areas. The main idea of the session was to bring together researchers in Hopf algebras, quantum groups, and tensor categories to exchange the most current ideas and techniques. The organizers were Nicolás Andruskiewitsch (Universidad Nacional de Córdoba, Argentina) and Dmitri Nikshych (University of New Hampshire, USA). We would like to thank all participants and speakers at the session for making it such an interesting and fruitful event.

The present volume contains ten articles contributed by the invited speakers of the session. These articles cover a wide variety of topics in the theory of tensor categories and Hopf algebras and contain a number of original results:

- Andruskiewitsch, Angiono, and Heckenberger study the finiteness of the Gelfand-Kirillov dimension of Nichols algebras of diagonal type.
- Bahturin and Kochetov develop the theory of non-associative graded simple algebras over real numbers.
- Beattie, Garcia, Ng, and Roat advance the classification of non-semisimple Hopf algebras with the Chevalley property.
- Bontea and Nikshych classify finite pointed braided tensor categories.
- Etingof presents a categorical interpretation of eigenvalues of the squared antipode in a weak Hopf algebras.
- He and Zhang prove the Cohen-Macaulay property of invariant subalgebras of Hopf dense Galois extensions.
- Lauve and Mastnak introduce and study the bicategory of bialgebra coverings.
- Nikshych classifies braidings on fusion categories in geometric terms.
- Ostrik establishes a non-trivial lower bound for the global dimension of a spherical fusion category.
- Vay gives a survey of Hopf algebras with a triangular decomposition.

We thank the editorial staff of *Contemporary Mathematics* and especially Christine Thivierge for the help with the preparation of this volume and the American

Mathematical Society for supporting this project. We are also grateful to the individual contributors and referees who invested quite a lot of their valuable time in writing and refereeing the articles.

This volume contains the proceedings of the scientific session “Hopf Algebras and Tensor Categories”, held from July 27–28, 2017, at the Mathematical Congress of the Americas in Montreal, Canada.

Papers highlight the latest advances and research directions in the theory of tensor categories and Hopf algebras. Primary topics include classification and structure theory of tensor categories and Hopf algebras, Gelfand-Kirillov dimension theory for Nichols algebras, module categories and weak Hopf algebras, Hopf Galois extensions, graded simple algebras, and bialgebra coverings.



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