Advances in Rings and Modules

Sergio R. López-Permouth
Jae Keol Park
S. Tariq Rizvi
Cosmin S. Roman
Editors
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This volume is dedicated to the memory of Professor Bruno J. Müller for his numerous contributions to the theory of Rings and Modules.
Bruno J. Müller (1934–2014)
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Preface

Bruno J. Müller was a dear colleague and a mathematical inspiration to each one of us. He was a leader in the field and a wise mentor and advisor to his doctoral students. Most of all, he was a dear friend, one that has been sorely missed since he passed away on October 27, 2014.

Based at McMaster University, Hamilton, Canada, and specializing in the theories of rings and modules, Bruno was a world-renowned mathematician. Among other topics, Bruno did pioneering work on Localizations, Duality, and on the Theory of Continuous and Discrete Modules.

He was an author of the first ever book (published by Cambridge University Press) detailing the latest research developments in the theory of continuous, discrete and extending modules. Since its publication in 1990, that seminal book became one of the most cited works in the area and continues today to be used by researchers around the world. Professor Müller contributed fundamental research papers in many areas of algebra and impacted the discipline through his many PhD students at McMaster University.

Bruno was passionate about mathematics; he loved rings and modules and other algebraic structures. To recognize his contributions to Algebra, this volume collects a series of contributions from members of the community presented here in remembrance of Bruno and as a tribute to his memory. We are thankful to all who have participated for their enthusiastic embrace of the project and for their valuable contributions.

All papers in the volume are peer-refereed as usual. We express our gratitude to all referees who helped in the review of the papers. The topics in the assortment of the papers of this volume include Almost Self-Injective Modules, Commutators and Anti-Commutators of Idempotents, Derivations, Differential Polynomial Rings, Distributive Hierarchies of Binary Operations, Generalizations of Injectivity, HNP (Hereditary Noetherian Prime) Rings, Intrinsic Extensions of Rings, Leavitt Path Algebras, Module Hulls, Module Invariants, Reduced Ring Orders, Tilting Cotorion Pairs, Twisted Invariants of Graded Algebras, and Universal Localizations.

As algebra continues to grow at a rapid pace, we hope the interesting results presented here will fuel and inspire young researchers for continued growth. We are sure Bruno would have enjoyed this volume and hope that you, the reader, will do the same.
As always, we are indebted to the staff of the American Mathematical Society for their outstanding work. Special thanks are due, in particular, to Ms. Christine Thivierge for her tireless efforts to see this project to conclusion. We are thankful to production editor Mike Saitas for his dedication and professional efforts to produce the nice final form of the volume.

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This volume, dedicated to Bruno J. Müller, a renowned algebraist, is a collection of papers that provide a snapshot of the diversity of themes and applications that interest algebraists today.

The papers highlight the latest progress in ring and module research and present work done on the frontiers of the topics discussed.

In addition, selected expository articles are included to give algebraists and other mathematicians, including graduate students, an accessible introduction to areas that may be outside their own expertise.