Group Theory, Combinatorics, and Computing
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International Conference in Honor of Daniela Nikolova-Popova’s 60th Birthday on Group Theory, Combinatorics and Computing
October 3–8, 2012
Florida Atlantic University, Boca Raton, Florida

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Editors
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Preface

This book contains the Proceedings of the international conference on Group Theory, Combinatorics and Computing held in Boca Raton, Florida, October 3–October 8, 2012 in honor of the 60th birthday of Daniela Nikolova-Popova. The event was organized by Florida Atlantic University in cooperation with the American Mathematical Society, the Association for Women in Mathematics, and the Institute of Combinatorics and its Applications.

The Scientific Committee for the conference consisted of D. Nikolova-Popova and S. Magliveras, Florida Atlantic University; T. Hurley, National University of Ireland – Galway; R. F. Morse, University of Evansville; L.-C. Kappe, Binghamton University; M. Klin, Ben Gurion University of the Negev (Israel); S. Witherspoon, Texas A&M University; and E. Ruet d’Auteuil, Institute of Combinatorics and its Applications (Canada).

The purpose of the conference was to bring together experts in group theory, combinatorics and computing to discuss computational, algorithmic and application aspects that have recently emerged at the interface between these areas. This meeting has helped to establish a scientific network among the participating universities and research centers in Europe and North America.

The conference included one-hour invited lectures and twenty-minute contributed talks. Two special sessions were organized: the first for women’s careers in mathematics and the second for young researchers. The event was also linked with the AMS regional meeting held October 13–14, 2012 at Tulane University in New Orleans.

This volume is a combination of survey and research articles from international experts in group theory and combinatorics. The contributions cover topics ranging from combinatorial group theory to graph and design theory, coding theory, cryptography and related areas in communications and computing. The survey articles are particularly useful for any advanced undergraduate students or new postgraduates wishing to acquire background material for projects or research.

It is our pleasure to thank the speakers and participants who made this conference a great success, the authors of these proceedings for their significant contributions, and the referees for their effective and accurate work.

The organizers thank Florida Atlantic University, the Davimos Family Foundation and the Institute of Combinatorics and its Applications for making this conference possible through their financial support.

Robert Fitzgerald Morse
Daniela Nikolova-Popova
Sarah Witherspoon
List of Lectures

N. Apostolakis: On liftable braids I: Coverings of the disk by disks
J. Beoku-Betts: “Those of us who wanted to do mathematics had more or less
to swim against the current”: Case study of a Nigerian mathematician
M. Bianchi: Graphs associated with conjugacy class sizes in finite groups (Part I)
B. Claiborne: Gender issues in research
R. Grigorchuk: On Gap Conjecture concerning group growth
C. Hering: Naive configurations
T. Hurley: Group ring matrices
D. Kahrobaei: Applications of polycyclic groups in information security
L. Klingler: On a conjecture of Zassenhaus
M. Krzywkowski: Minimal total dominating sets in graph classes: Combinatorial
bounds and enumeration
R. Laue: Decompositions of Kramer-Mesner matrices
P. Longobardi: Some results on products of subsets of groups
S. Magliveras: Non-abelian cryptography
M. Maj: On groups with few isomorphism types of derived subgroups
J. Moori: Designs and codes from $\text{PSL}_2(q)$
M. Neumann-Brosig: On the hyperbolicity of strict Pride groups
D. Niklova-Popova: Life challenges of a female group theorist
A. Yu. Olshanskiy: On the embeddings of solvable and amenable groups
E. Pacifici: Graphs associated with conjugacy class sizes in finite groups (Part II)
P. Plaumann: Partitions of connected Lie groups
F. Richman: Walker’s cancellation theorem
D. Savchuk: Self-similar groups acting essentially freely on the boundary of a
rooted tree
M. Schmidmeier: Operations on arc diagrams and a degeneration result for linear
operators
S. Smith: Motion, distinguishing number and orbit equivalence in infinite groups
A. Zalesski: On generalizations of the Gelfand-Graev and the Steinberg characters
M. Zyman: Adjunction of roots in exponential $A$-Groups
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This volume contains the proceedings of the International Conference on Group Theory, Combinatorics and Computing held from October 3–8, 2012, in Boca Raton, Florida.

The papers cover a number of areas in group theory and combinatorics. Topics include finite simple groups, groups acting on structured sets, varieties of algebras, classification of groups generated by 3-state automata over a 2-letter alphabet, new methods for construction of codes and designs, groups with constraints on the derived subgroups of its subgroups, graphs related to conjugacy classes in groups, and lexicographical configurations. Application of computer algebra programs is incorporated in several of the papers.

This volume includes expository articles on finite coverings of loops, semigroups and groups, and on the application of algebraic structures in the theory of communications.

This volume is a valuable resource for researchers and graduate students working in group theory and combinatorics. The articles provide excellent examples of the interplay between the two areas.