

PREFACE

PROCEEDINGS OF THE SECOND HONOLULU CONFERENCE ON ABELIAN GROUPS AND MODULES

The Second Honolulu Conference on Abelian Groups and Modules was held at the University of Hawaii, Manoa campus, July 25–August 1, 2001. Fifty-nine mathematicians from 18 different countries participated and a total of 48 talks were given. Baylor University and the University of Hawaii jointly sponsored this conference. Co-organizers of the conference and co-editors of these proceedings were David M. Arnold, Baylor University, and Adolf Mader, University of Hawaii.

The year 2001 is arguably the 200th anniversary of the beginning of abelian group theory (see R. Göbel, *Remarks about the history of abelian groups in England and Germany*, this issue) and the 40th anniversary of what is generally recognized as the first international conference on abelian group theory. As a result, the conference was partially devoted to the history of abelian group theory and related topics.

Two distinguished mathematicians, Paul Cohen and Peter J. Hilton, each gave two 50-minute lectures on the origins and history of homological algebra and forcing theory, respectively. Both of these areas of mathematics are important tools for research in abelian group theory. Written versions of these lectures are included in these proceedings.

In addition, nine senior researchers were asked to prepare 30-minute lectures, with written versions to be published in the proceedings, on various aspects of the history of abelian group theory. These specific requests were, roughly speaking, of two types, an overview of the history of selected central topics in abelian group theory (P. Eklof—set theory and abelian group theory and P. Hill— p -groups) and a brief history, including personal anecdotes, if appropriate, of abelian group theory in selected countries or regions (A. Fomin—Russia; L. Fuchs—Hungary; R. Göbel—England and Germany; J. Reid—University of Washington; L. Salce—Italy and the Czech Republic; D. Simson—Poland; and E. Walker—New Mexico State University). These diverse articles include a variety of perspectives on the subject and on those people

responsible for its development. Numerous instances of cooperation and joint investigation of researchers from different countries in these articles demonstrate that abelian group theory is truly an international discipline. A brief summary of 23 international conferences on abelian group theory held since 1961 is included in this volume. Some of these conferences are mentioned in the historical articles as being important to the direction of research in abelian group theory.

The historical articles on abelian group theory in these proceedings are, collectively, far from being a comprehensive history of abelian group theory. That history remains to be written. The authors were under severe time and space restrictions imposed by the editors. These articles, then, amount to a snapshot of the history and origins of the subject written by some of the people instrumental in its development. Unfortunately, as in any synopsis of a complex topic, much is omitted. Many important people, research topics, countries and regions are not even mentioned. The editors hope that these omissions will not be taken personally, as they were not intentional. Rather, we wish that historical articles to be written in the future will fill in some of the many gaps and omissions and provide different perspectives of the history of abelian group theory.

Another focus of this conference was on “young” researchers in abelian group theory and related topics. Four promising young researchers were asked to give 50-minute talks: Greg Hjorth, *On determining the classification difficulty of countable torsion-free abelian groups*; Peter Loth, *Purity and topological purity in locally compact abelian groups*; Bruce Olberding, *Applications of the study of torsion-free modules to commutative algebras*; and Lutz Strüngmann, *A consistency result on infinite rank Butler groups*. Written versions of the survey talks by Greg Hjorth and Bruce Olberding are included in this issue.

Most of the conference was devoted to presentations of current research in abelian group theory and related topics as reflected by the original research articles included in this issue. All articles were refereed, in some cases by more than one person. While some of the articles and talks are devoted to topics entirely within abelian group theory, many testify to the interchange of results and ideas between abelian group theory and various other topics such as logic and set theory,

modules over more general rings, representations of partially ordered sets and clans, K -theory, rings, topology and Boolean algebras.

David M. Arnold
Department of Mathematics
Baylor University, Waco, TX 76798-7328
E-mail address: David_Arnold@baylor.edu

Adolf Mader
Department of Mathematics, University of Hawaii
2565 The Mall, Honolulu, HI 96822-2233
E-mail address: adolf@math.hawaii.edu

CONFERENCE SPEAKERS

Silvana Bazzoni, *Extending the notion of cotorsion abelian groups to modules over commutative domains*

Paul Cohen, *Forcing and independence results*

Dikran Dikranjan, *Functorial topologies can measure algebraic invariants of abelian groups*

Ulrich Dittmann, *Tight subgroups of almost completely decomposable groups*

Manfred Dugas, *Completely decomposable groups with one distinguished completely decomposable subgroup*

Paul Eklof, *The affinity of set theory and abelian group theory*

Robert El Bashir, *On covers and covering morphisms*

Alexander Fomin, *Abelian groups in Russia*

Alexander Fomin, *Quotient divisible mixed groups*

Laszlo Fuchs, *Abelian groups in Hungary*

Laszlo Fuchs, *Additive ideal theory in non-noetherian domains*

Rüdiger Göbel, *Abelian groups in England and Germany*

Brendan Goldsmith, *Some aspects of minimality in abelian groups*

Vishal Goundar, *On spectra of graphs related to free products of abelian groups*

Zhifeng Hao and Lianggui Feng, *A note on I_0 -rings and I_0 -modules over generalized triangular matrix rings*

Ola Helenius, *The Kervaire-Murthy conjectures and unit-type bases in integer group rings*

Peter Hilton, *The birth of homological algebra*

Greg Hjorth, *On determining the classification difficulty of countable torsion free abelian groups*

George Ivanov, *A characterization of fgc rings*

Friedrich Kasch, *Local-injective and local-projective modules*

Pjek-Hwee Lee, *A note on compositions of derivations of prime rings*

Tsiu-Kwen Lee, *Skew derivations algebraic over prime rings and their constants*

Sergio Lopez-Permouth, *Modules with the internal exchange property*

Peter Loth, *Purity and topological purity in locally compact abelian groups*

Claudia Metelli, *Decomposing base-changes of $B(1)$ -groups*

Otto Mutzbauer, *Regular chains of Butler groups*

Michael Nahler, *Isomorphism classes of uniform groups*

Takashi Okuyama, *Quasi-purifiable subgroups and height matrices*

Bruce Olberding, *Applications of the study of torsion-free modules to commutative algebra*

Chun-Gil Park, *Derivations in Banach modules*

Jae Keol Park, *Quasi-Baer hulls of rings*

Kulumani M. Rangaswamy, *On the stacked bases theorem and generalizations*

Jim Reid, *Mid-century in Seattle*

Fred Richman, *Pre-abelian clan categories*

S. Tariq Rizvi, *On the extending properties for fully invariant submodules*

Luigi Salce, *Abelian group theory in Italy*

Phill Schultz, *The upper central series of the maximal normal p -subgroup of $\text{Aut}(G)$*

Daniel Simson, *Jerzy Loś and a history of abelian groups in Poland*

Daniel Simson, *A problem of D. Arnold and subprojective representations of posets over uniserial algebras*

Lutz Strümgmann, *A consistency result on infinite rank Butler groups*

K. Varadarajan, *Noetherian generalized power series rings and modules*

Charles Vinsonhaler, *K_0 -like constructions for almost completely decomposable groups*

Elbert Walker, *Abelian groups at New Mexico State University*

Bill Wickless, *Multi-isomorphism for mixed groups*

Tsai-Lien Wong, *Certain additive subgroups on prime rings*

Mohamed F. Yousif, *On three open questions on quasi-Frobenius rings*

Paolo Zanardo, *μ -independence and quadratic μ -independence in the construction of indecomposable finitely generated modules*

Yiquiang Zhou, *An annihilator condition of modules*

CONFERENCE PARTICIPANTS

David M. Arnold
Dept. of Mathematics, Baylor University
Waco, TX 76798-7328
E-mail: David_Arnold@baylor.edu

Silvana Bazzoni
Dipart. di Mat. Pura e Appl., Università di Padova
Via Belzoni 7, 35131 Padova, Italy
E-mail: bazzoni@math.unipd.it

Khalid Benabdallah
Dept. of Mathematics and Statistics
University of Montreal, Montreal H3C 3J7, Canada
E-mail: benabdal@ere.umontreal.ca

Paul Cohen
Dept. of Mathematics, Stanford University
Palo Alto, CA 94305
E-mail: pjcohen@yahoo.com

Jeffrey DeCunha
Dept. of Mathematics, Baylor University
Waco, TX 76798-7328
E-mail: Judy_Dees@baylor.edu

Dikran Dikranjan
Dipart. di Mat. Pura e Appl., Università di Udine
Udine, Italy
E-mail: dikranja@dimi.uniud.it

Ulrich Dittmann
Universität Würzburg, Mathematisches Institut
Am Hubland, 97074 Würzburg, Germany
E-mail: Ulrich.Dittmann@Allianz.de

Manfred Dugas
Dept. of Mathematics, Baylor University
Waco, TX 76798-7328
E-mail: Manfred_Dugas@baylor.edu

Paul Eklof
Dept. of Mathematics, University of California Irvine
Irvine, CA 92697-3875
E-mail: peklof@math.uci.edu

Robert El Bashir
Matematicko Fyzikalni Fakulta, Universita Karlova
Sokolovska 83, Praha 8, Karlin, Czech Republic
E-mail: bashir@karlin.mff.cuni.cz

Alexander Fomin
La Universidad Antonio Narino
Olimpiadas Colombianas en Matematicas
Cra 38 #58 A 77, Bogota, Columbia
E-mail: mfomin@cable.net.co

Laszlo Fuchs
Dept. of Mathematics, Tulane University
New Orleans, LA 70118-5698
E-mail: fuchs@tulane.edu

Rüdiger Göbel
Fachbereich 6, Mathematik und Informatik
Universität Essen, 45117 Essen, Germany
E-mail: r.goebel@uni-essen.de

Brendan Goldsmith
Dept. of Mathematics, Dublin Institute of Technology
Kevin Street, Dublin 8, Eire Ireland
E-mail: brendan.goldsmith@dit.ie

Vishal Goundar
University of the South Pacific
C/O Maths and Computing Science,
P.O. Box 1168, USP, Suva, Fiji
E-mail: s5007484@manu.usp.ac.fj

Zhifeng Hao
Department of Applied Mathematics
South China University of Technology
Guangzhou 510641, P.R. China
E-mail: mazfhao@scut.edu.cn

Jutta Hausen
Dept. of Mathematics, University of Houston
Houston, TX 77204-3476
E-mail: hausen@uh.edu

Ola Helenius
Department of Mathematics
Chalmers University of Technology and Göteborg University
SE-4896 Göteborg, Sweden
E-mail: olahe@math.chalmers.se

Peter J. Hilton
Mathematical Science Dept., SUNY at Binghamton
Binghamton, NY 13902-6000
E-mail: marge@math.binghamton.edu

Greg Hjorth
Dept. of Mathematics, University of California Los Angeles
Los Angeles, CA 90095-1555
E-mail: greg@math.ucla.edu

George Ivanov
Dept. of Mathematics, Macquarie University
NSW 2109, Australia
E-mail: ivanov@maths.mq.edu.au

Friedrich Kasch
Ulrichstr. 16, 82057 Icking, Germany
E-mail: Friedrich.Kasch@t-online.de

Patrick Keef
Dept. of Mathematics, Whitman College
Walla Walla, WA 99362
E-mail: keef@whitman.edu

Toshiko Koyama
5-24-21-703 Koishikawa
Bunkyo-ku, Tokyo 112-0002, Japan
E-mail: koyama@is.ocha.ac.jp

Pjek-Hwee Lee
Dept. of Mathematics, National Taiwan University
Taipei 106, Taiwan
E-mail: phlee@math.ntu.edu.tw

Tsiu-Kwen Lee
Dept. of Mathematics, National Taiwan University
Taipei 106, Taiwan
E-mail: tklee@math.ntu.edu.tw

Wolfgang Liebert
Mathematisches Institut, Technische Universität München
D-800 München, Germany
E-mail: liebert@mathematik.tu-muenchen.de

Sergio R. Lopez-Permouth
Department of Mathematics, 321 Morton Hall
Ohio University, Athens, OH 45701
E-mail: slopez@oucsace.cs.ohiou.edu

Peter Loth
Dept. of Mathematics, Sacred Heart University
5151 Park Avenue, Fairfield, CT 06432
E-mail: lothp@bestweb.net

Adolf Mader
Dept. of Mathematics, University of Hawaii
2565 The Mall, Honolulu, HI 96822-2233
E-mail: adolf@math.hawaii.edu

Warren May
Dept. of Mathematics, University of Arizona
Tucson, AZ 85721
E-mail: may@arizona.edu

Claudia Metelli
Dip. di Matematica i Applicazioni, Università di Napoli
Via Cinthia, Complesso Monte S. Angelo, Edificio T
80126 Napoli, Italy
E-mail: cmetelli@math.unipd.it

Ray Mines
 Dept. of Mathematics, New Mexico State University
 Las Cruces, NM 88003-0105
E-mail: ray@nmsu.edu

Otto Mutzbauer
 Universität Würzburg, Mathematisches Institut
 Am Hubland, 97074 Würzburg, Germany
E-mail: mutzbauer@mathematik.uni-wuerzburg.de

Michael Nahler
 Universität Würzburg, Mathematisches Institut
 Am Hubland, 97074 Würzburg, Germany
E-mail: nahler@mathematik.uni-wuerzburg.de

Takashi Okuyama
 Dept. of Mathematics, Toba Natl. College of Maritime Technology
 1-1, Ikegami-cho, Toba-shi, Mie-ken, 517-8501, Japan
E-mail: okuyamat@toba-cmt.ac.jp

Bruce Olberding
 Dept. of Mathematics, New Mexico State University
 Las Cruces, NM 88003-0105
E-mail: olberdin@nmsu.edu

Chun-Gil Park
 Dept. of Mathematics, Chungnam National University
 Taejon, 305-764, South Korea
E-mail: cgpark@math.chungnam.ac.kr

Jae Keol Park
 Dept. of Mathematics, Busan National University
 Busan, 609-735, Korea
E-mail: jkpark@hyowon.cc.pusan.ac.kr

Kulumani M. Rangaswamy
 Dept. of Mathematics, University of Colorado
 Box 7150, Colorado Springs, CO 80933-7150
E-mail: ranga@math.uccs.edu

James D. Reid
Dept. of Mathematics, Wesleyan University
Middleton, CT 06459-0128
E-mail: `jreid@tidewater.net`

Fred Richman
Dept. of Mathematics, Florida Atlantic University
Boca Raton, FL 33431-0991
E-mail: `richman@fau.edu`

Seog-Hoon Rim
Dept. of Mathematics Education, Teachers College
Kyungpook National University
Taegu, 702-701, South Korea
E-mail: `shrim@bh.knu.ac.kr`

S. Tariq Rizvi
Dept. of Mathematics, The Ohio State University
Lima, OH 45804
E-mail: `rizvi.1@osu.edu`

Luigi Salce
Dipart. di Mat. Pura e Appl., Università di Padova
Via Belzoni 7, 35131, Padova, Italy
E-mail: `salce@math.unipd.it`

Phil Schultz
Dept. of Math. and Stat., The University of Western Australia
35 Stirling Highway, Nedlands, 6009, Australia
E-mail: `schultz@maths.uwa.edu.au`

Daniel Simson
Nicholas Copernicus University, Faculty of Math. and Computer Sci.
ul. Chopina 12/18, 87-100 Torun, Poland
E-mail: `simson@mat.uni.torun.pl`

Alexander Stolin
Department of Mathematics
Chalmers University of Technology and Göteborg University
SE-41296, Göteborg, Sweden
E-mail: `astolin@math.chalmers.se`

Lutz Strüingmann
 Institute for Mathematics, The Hebrew University
 Givat Ram, Jerusalem 91904, Israel
E-mail: lutz@math.huji.ac.il

Noriko Tone
 Tokyo Denki University
 2-2 Kanda Nishikicho, Chiyodaku
 Tokyo 101-8457, Japan
E-mail: tone@cck.dendai.ac.jp

K. Varadarajan
 Dept. of Mathematics, University of Calgary
 Calgary, Alberta T6G 2G1, Canada
E-mail: varadara@math.ucalgary.ca

Charles I. Vinsonhaler
 Dept. of Mathematics, University of Connecticut
 U-9, Storrs, CT 06269-3009
E-mail: vinson@uconnvm.uconn.edu

Carol Walker
 Dept. of Mathematics, New Mexico State University
 Las Cruces, NM 88003-0105
E-mail: hardy@nmsu.edu

Elbert A. Walker
 Dept. of Mathematics, New Mexico State University
 Las Cruces, NM 88003-0105
E-mail: elbert@nmsu.edu

William J. Wickless
 Dept. of Mathematics, University of Connecticut
 U-9, Storrs, CT 06269-3009
E-mail: wickless@math.uconn.edu

Tsai-Lien Wong
 Dept. of Applied Mathematics, National Sun Yat-Sen University
 Kaohsiung, Taiwan 00804
E-mail: tliwong@math.nsysu.edu.tw

Mohamed F. Yousif
Dept. of Mathematics, The Ohio State University
Lima, Ohio 45804
E-mail: `yousif.1@osu.edu`

Paolo Zanardo
Dipart. di Mat. Pura e Appl., Università di Padova
Via Belzoni 7, 35131, Padova, Italy
E-mail: `pzanardo@math.unipd.it`

Yiquiang Zhou
Department of Mathematics and Statistics
Memorial University of Newfoundland
St. John's, A1C 5S7 Canada
E-mail: `zhou@math.mun.ca`