

Proceedings of Symposia in PURE MATHEMATICS

Volume 81

Superstrings, Geometry, Topology, and C^* -algebras

Robert S. Doran
Greg Friedman
Jonathan Rosenberg
Editors



American Mathematical Society

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American Mathematical Society
Providence, Rhode Island

NSF-CBMS REGIONAL CONFERENCE ON
MATHEMATICS ON TOPOLOGY, C^* -ALGEBRAS,
AND STRING DUALITY,
HELD AT TEXAS CHRISTIAN UNIVERSITY,
FORT WORTH, TEXAS, MAY 18–22, 2009

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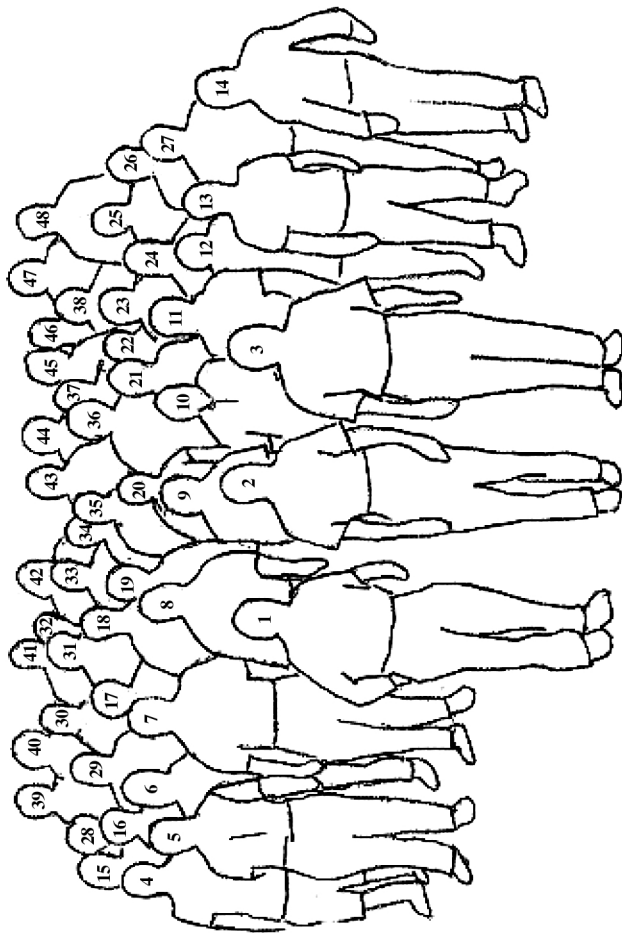
Preface

The Conference Board of the Mathematical Sciences (CBMS) hosted a regional conference, funded by the National Science Foundation, during the week of May 18–22, 2009, entitled *Topology, C^* -algebras, and String Duality* at Texas Christian University in Fort Worth, Texas. The principal lecturer was Jonathan Rosenberg of the University of Maryland, whose conference lectures have been published in Volume 111 of the CBMS's Regional Conference Series in Mathematics. In addition to Professor Rosenberg's lectures, the conference featured talks by fifteen other speakers on topics related to his lectures and the general theme of the conference. The purpose of this volume is to collect the contributions of these speakers and other participants. All papers have been carefully refereed and will not appear elsewhere. At first sight these papers, which are highly interdisciplinary, may appear unrelated. To provide direction and historical context for the reader, a technical introduction describing how the various papers fit together in a natural way has been written by Professor Rosenberg. It appears as the first article in the volume.

The editors express their sincere gratitude and thanks to the speakers for their beautiful talks and their willingness to spend many hours writing them up so that the results would be available to the larger scientific community. In addition, we acknowledge the hard work and help of the referees. We thank the Conference Board of the Mathematical Sciences and the National Science Foundation for their support via NSF Grant DMS-0735233. We thank Sergei Gelfand, Christine Thivierge, and the dedicated staff at the American Mathematical Society for their efforts in publishing these proceedings. Finally, we thank Texas Christian University and all the participants who helped ensure a wonderfully successful conference.

Robert S. Doran
Greg Friedman
Jonathan Rosenberg





1. Greg Friedman 2. Jonathan Rosenberg 3. Robert Doran 4. Shilin Yu 5. Matthew Ando 6. Huichi Huang
 7. Varghese Mathai 8. Efton Park 9. Ruth Gornet 10. Rishmi Ratnam 11. Stefan Mendez-Diez 12. Sooran Kang
 13. Pedram Hekmati 14. Jacques Distler 15. Phu Chung 16. Seunghun Hong 17. Valentin Deaconu 18. Dorin Dumitrascu
 19. Alan Carey 20. Rebecca Chen 21. Marc A. Rieffel 22. Letty Reza 23. Mart Abel 24. Hisham Sati 25. Jon Sjogren
 26. Eric Sharpe 27. Ken Richardson 28. John Skukalek 29. Michael Tseng 30. Jody Trout 31. Peter Bouwknecht
 32. Wang Qingyun 33. Nigel Higson 34. Daniel Freed 35. Mark Tomforde 36. Magnus Goffeng 37. Claude Schochet
 38. Bruce Doran 39. John Huerta 40. Jacob Shotwell 41. Daniel Pape 42. James West 43. Jonathan Block
 44. Loredana Ciurdariu 45. Loren Spice 46. Anna Spice 47. Dana Williams 48. Braxton Collier
- Not pictured: Paul Baum, Alexander A. Katz, Snigdha Mahanta, Scott Nollet

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Conference Attendees

Mart Abel
University of Tartu

Matthew Ando
University of Illinois

Paul Baum
Pennsylvania State University

Jonathan Block
Pennsylvania State University

Peter Bouwknegt
Australian National University

Alan Carey
Australian National University

Rebecca Chen
University of Houston

Phu Chung
University at Buffalo

Loredana Ciurdariu
University Politechnic of Timisoara

Braxton Collier
University of Texas at Austin

Valentin Deaconu
University of Nevada, Reno

Jacques Distler
University of Texas at Austin

Robert Doran
Texas Christian University

Bruce Doran
Accenture

Dorin Dumitrascu
Northern Arizona University

Daniel Freed
University of Texas at Austin

Greg Friedman
Texas Christian University

Magnus Goffeng
Chalmers University of Technology and
University of Gothenburg

Ruth Gornet
University of Texas at Arlington

Pedram Hekmati
Royal Institute of Technology

Nigel Higson
Pennsylvania State University

Seunghun Hong
Pennsylvania State University

Huichi Huang
University at Buffalo

John Huerta
University of California, Riverside

Sooran Kang
University of Colorado at Boulder

Alexander A. Katz
St. John's University

Snigdhasayan Mahanta
Johns Hopkins University

Varghese Mathai
University of Adelaide

Stefan Mendez-Diez
University of Maryland

Scott Nollet
Texas Christian University

Daniel Pape
Mathematisches Institut Göttingen

Efton Park
Texas Christian University

Wang Qingyun
Washington University in St. Louis

Rishni Ratnam
Australian National University

Letty Reza
University of Houston

Ken Richardson
Texas Christian University

Marc A. Rieffel
University of California, Berkeley

Jonathan Rosenberg
University of Maryland

Hisham Sati
Yale University

Claude Schochet
Wayne State University

Eric Sharpe
Virginia Tech

Jacob Shotwell
Arizona State University

Jon Sjogren
Air Force Office of Scientific Research

John Skukalek
Pennsylvania State University

Anna Spice
University of Michigan

Loren Spice
University of Michigan

Mark Tomforde
University of Houston

Jody Trout
Dartmouth College

Michael Tseng
Pennsylvania State University

James West
University of Houston

Dana Williams
Dartmouth College

Shilin Yu
Pennsylvania State University

Conference Speakers

Jonathan Rosenberg
Topology, C^ -algebras, and String
Duality*

Matthew Ando
*Twisted Generalized Cohomology and
Twisted Elliptic Cohomology*

Paul Baum
Equivariant K Homology

Jonathan Block
*Homological Mirror Symmetry and
Noncommutative Geometry*

Peter Bouwknegt
*The Geometry Behind Non-geometric
Fluxes*

Alan Carey
Twisted Geometric Cycles

Jacques Distler
Geometry and Topology of Orientifolds I

Dan Freed
Geometry and Topology of Orientifolds II

Nigel Higson
*The Baum-Connes Conjecture and
Parametrization of Representations*

Sooran Kang
*The Yang-Mills Functional and
Laplace's Equation on Quantum
Heisenberg manifolds*

Varghese Mathai
*The Index of Projective Families of
Elliptic Operators*

Marc Rieffel
*Vector Bundles for "Matrix Algebras
Converge to the Sphere"*

Hisham Sati
*Fivebrane Structures in String Theory
and M-theory*

Claude Schochet
An Update on the Unitary Group

Eric Sharpe
*GLSMs, Gerbes, and Kuznetsov's
Homological Projective Duality*

Dana Williams
Proper Actions on C^ -algebras*

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