CONTEMPORARY MATHEMATICS

553

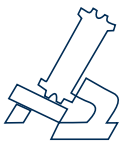
Israel Mathematical Conference Proceedings

Complex Analysis and Dynamical Systems IV

Part 1. Function Theory and Optimization

Fourth International Conference on
Complex Analysis and Dynamical Systems
May 18–22, 2009
Nahariya, Israel

Mark Agranovsky, Matania Ben-Artzi,
Greg Galloway, Lavi Karp, Simeon Reich,
David Shoikhet, Gilbert Weinstein,
Lawrence Zalcman
Editors



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Providence, Rhode Island

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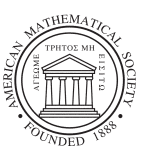

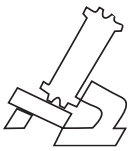

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Preface

The Fourth International Conference on Complex Analysis and Dynamical Systems (CA&DS IV), sponsored by ORT Braude College (Karmiel, Israel), Bar-Ilan University (Ramat-Gan, Israel) and the University of Miami (Miami, USA), took place at the Carlton Hotel in Nahariya, Israel, during May 18-22, 2009. The conference was devoted to the interaction between various branches of Mathematical Analysis and was organized into three main parallel sessions: Complex Analysis, Partial Differential Equations, and General Relativity. Altogether, over 100 participants from 17 countries attended the Conference.

These proceedings, which comprise two volumes, are the tangible record of the Conference. Most of the papers collected here have been contributed by participants in the Conference. In some cases, they have chosen to submit manuscripts which depart from the texts of their lectures. Several invited speakers who were unable to attend the Conference also contributed papers to these proceedings. All submissions have been carefully refereed. The papers in this first volume are mainly devoted to Function Theory and Optimization while the papers in the second volume deal with Partial Differential Equations, Geometry, and General Relativity.

We acknowledge with thanks the support provided for the Conference by the Galilee Research Center for Applied Mathematics of ORT Braude College, the Gelbart Research Institute for Mathematical Sciences of Bar-Ilan University, the ESF Networking Programme "Harmonic and Complex Analysis and Applications," the Edmund Landau Minerva Center for Research in Mathematical Analysis and Related Areas of the Hebrew University, the U.S. National Science Foundation (Grant No. 0911292), and the University of Miami. Finally, we thank Miriam Beller, who (as in previous volumes) served as technical editor.

The Editors

Conference Program

May 18–22, 2009

Monday, May 18

09:00 - 11:00 Coffee and Registration
11:00 - 11:15 Opening

Plenary Talk

14:20 - 15:05 G. Q. Chen
Nonlinear conservation laws of mixed type in mechanics and geometry

Afternoon Session 1

14:00 - 14:30 D. Khavinson
"Fingerprints" of the two dimensional shapes and lemniscates

14:35 - 15:05 K. Dyakonov
Blaschke products and nonideal ideals in Lipschitz algebras

15:10 - 15:40 L. Aizenberg, E. Liflyand
Hausdorff operators on Hardy spaces in C^n

16:10 - 16:40 F. Bracci
Evolution families and the Loewner equation

16:45 - 17:15 T. Kuczumow
Intersections of holomorphic retracts

17:20 - 17:50 S. Plaksa
Commutative algebras associated with classic equations of mathematical physics

Afternoon Session 2

14:00 - 14:30 M. Demuth
Where are the eigenvalues of nonselfadjoint operators?

14:35 - 15:05 B. Rubin
Comparison of volumes of convex bodies in real, complex, and uaternionic spaces

15:10 - 15:40 V. Golubyatnikov
Dynamics in p53-Mdm2 DNA damage repair network

16:10 - 16:40 M. Monastyrskii
Hecke surfaces and duality transformations in lattice spin models

16:45 - 17:15 A. Ukhlov
Composition Operators in Sobolev spaces

17:20 - 17:50 M. Karmanova
The area formula for Lipschitz mappings of Carnot-Carathéodory spaces

Afternoon Session 3: Special Session Control Theory

14:00 - 14:30 G. Kurina
Asymptotic solution of optimal with control problems intermediate points and small parameter in performance index

14:35 - 15:05 A. Zaslavski
Optimal control systems arising in economic dynamics

15:10 - 15:40 I. Ioslovich
Optimal control of dynamical biological system: maintenance of balanced growth and development

16:10 - 16:40 V. Turetsky
Cheap control in generalized linear-quadratic differential game

Tuesday, May 19

Plenary Talk

09:00 - 09:50 M. Lyubich
Renormalization and infinitedimensional complex geometry

Morning Session 1

10:00 - 10:30 A. Vasiliev
Conformal field theory viewpoint on contour dynamics

11:00 - 11:30 A. Solynin
Some recent results in classical complex analysis

11:35 - 12:05 A. G. O'Farrell
Reversible biholomorphic germs

12:10- 12:40 D. Prokhorov
Asymptotic coefficient estimates for regular and singular Löwner trajectories

Morning Session 2

10:00 - 10:30 V. Rabinovich
Essential spectra and exponential estimates of eigenfunctions of lattice operators of quantum mechanics

11:00 - 11:30 J. Kozicki
Quantum stabilization of systems of interacting anharmonic oscillators

11:35 - 12:05 Y. Pinchover
On Liouville theorems for p-Laplacian-type equations

12:10 - 12:40 V. Liskevich
Some qualitative properties of second-order elliptic and parabolic equations

Morning Session 3

10:00 - 10:30 L. Andersson
Hidden symmetries and the wave equation on Kerr

11:00 - 11:30 J. Isenberg
Asymptotic gluing of asymptotically hyperbolic solutions to the Einstein Constraint equations

11:35 - 12:05 J. Smulevici
Structure of singularities of spacetimes with toroidal or hyperbolic symmetry

12:10 - 12:40 F. Schwartz
On the topology of black holes

Afternoon Session 1

14:30 - 15:00 C. Beneteau
Zeros of certain kernel functions in the Fock space

15:05 - 15:35 Y. Weit
On the translates of powers of a continuous periodic function

16:10 - 16:40 S. Krushkal
Zalcman's conjecture and related problems

16:45 - 17:15 S. Díaz-Madrigal
Generalized Loewner chains in the unit disk

17:20 - 17:50 R. Dwilewicz
Global holomorphic approximations of Cauchy-Riemann functions

Afternoon Session 2

14:30 - 15:00 B. Paneah
Noncommutative dynamical systems with two generators and their applications in analysis

15:05 - 15:35 V. Katsnelson
The truncated Fourier Operator

16:10 - 16:40 E. Saucan
Triangulations, quasiregular mappings and differential geometry

16:45 - 17:15 M. Dalla Riva
A singularly perturbed nonlinear traction problem in linearized elastostatics

Afternoon Session 3

14:30 - 15:00 M. Reiris
Scalar curvature, the isoperimetric inequality and the Einstein flow in the Constant Mean Curvature gauge

15:05 - 15:35 B. Smith
Black hole initial data with a horizon of prescribed intrinsic geometry

Wednesday, May 20

Plenary Talk

09:00 - 09:50 V. Maz'ya
Higher order elliptic problems in nonsmooth domains

Morning Session 1

10:00 - 10:30 S. Kaliman
Algebraic density property of homogeneous spaces

10:35 - 11:05 C. Fabritiis
Continuous iteration in nonstrictly convex domains: the polydisk case

11:10 - 12:40 T. Casavecchia
A rigidity condition for generators in strongly convex domains

Morning Session 2

10:00 - 10:30 M. Brakalova
Circle-like behavior and asymptotic homogeneity

10:35 - 11:05 B. Bojarski
The Beltrami equations: 54 years

Morning Session 3

10:00 - 10:30 P. Chruściel
On the characteristic Cauchy problem in general relativity

10:35 - 11:05 D. Pollack
Initial data for vacuum spacetimes with a positive cosmological constant

11:10 - 11:40 D. Maxwell
On solutions of the Einstein constraint equations obtained by the conformal method

Thursday, May 21

Plenary Talks

09:00 - 09:50 S. Klainerman
Uniqueness of stationary black holes without analyticity

10:00 - 10:50 A. Hinkkanen
Martingales and rotations

Morning Session 1

11:20 - 11:50 J. Zając
Harmonic mappings and quasihomographies in the theory of Teichmüller space

11:55 - 12:25 G. Gentili
A geometric theory of regular functions over quaternions

12:30 - 13:30 V. Zaharyuta
Bases in spaces of analytic functions and applications

Morning Session 2

11:20 - 11:50 M. Lanza de Cristoforis
Singular perturbation problems in potential theory: a functional analytic approach

11:55 - 12:25 J. Wirth
Decay estimates for anisotropic thermoelasticity

12:30 - 13:30 I. Markina
The notion of the sub-Lorentzian geometry

Morning Session 3

11:20 - 11:50 L. Kapitanski
Analytic form of the Pontrjagin-Hopf invariants

11:55 - 12:25 M. Eichmair
Nonvariational existence problems in geometry and general relativity

12:30 - 13:30 J. Corvino
Constructions of N-body solutions of the Einstein constraint equations

Afternoon Session 1

14:30 - 15:00 T. J. Suffridge
De la Vallée Poussin Means of convex holomorphic mappings of the ball in $\mathbf{C}^n$

15:05 - 15:35 D. Lubinsky
Universality limits for random matrices and de Branges spaces

16:10 - 16:40 A. Sidi
Vectorvalued rational interpolation in the complex plane

16:45 - 17:15 F. Vlacci
Rigidity for holomorphic and regular maps

17:20 - 17:50 A. Goldstein
Plaque inverse limit and generalized conjugations of inverse dynamical systems and their applications in holomorphic dynamics functions

Afternoon Session 2

14:30 - 15:00 M. Reissig
Decay rates for wave models with structural damping

15:05 - 15:35 A. Golberg
Homeomorphisms with integrally restricted moduli

16:10 - 16:40 V. Palamodov
Compulsory extension of solutions of analytic PDE

16:45 - 17:15 A. Kytmanov
On the asymptotic expansion of the conormal symbol of the singular Bochner-Martinelli integral

Afternoon Session 3 – Special Session: Algebra and Geometry

14:30 - 15:00 D. Akhiezer
Stein manifolds and multiplicity free representations of compact Lie groups

15:05 - 15:35 S. Selivanova
On some metrical aspects of the theory of Carnot-Carathéodory spaces

16:10 - 16:40 K.-D. Semmler
Hyperbolic polygons, Riemann surfaces and Helling matrices

Friday, May 22

Morning Session 1

09:00 - 09:30 C. Bisi
On proper polynomial maps of C^2

09:35 - 10:05 A. Danielyan
On an approximation problem of L. Zalcman

10:10 - 10:40 S. Myslivets
On the conditions $\overline{\partial}$-closed extension of differential forms

Morning Session 2

09:00 - 09:30 I. Spitkovsky
Factorization of almost periodic matrix functions, and related functional equations

09:35 - 10:05 J. Zemánek
On operators with single spectrum

Morning Session 3

09:00 - 09:30 R. Beig
The stationary n-body problem in general relativity

09:35 - 10:05 S. Alexakis
Unique continuation for the vacuum Einstein equations

10:10 - 10:40 C. Williams
Predicting long term behavior of marginally trapped tubes from initial data

Plenary Talk

11:10 - 12:00 I. Rodnianski
Black holes and linear waves

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