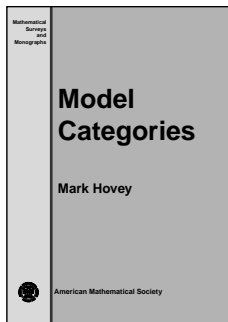


New Publications Offered by the AMS

Algebra and Algebraic Geometry



Model Categories

Mark Hovey, *Wesleyan University, Middletown, CT*

Model categories are a tool for inverting certain maps in a category in a controllable manner. As such, they are useful in diverse areas of mathematics. The list of such areas is continually growing.

This book is a comprehensive study of the relationship between a model category and its homotopy category. The author develops the theory of model categories, giving a careful development of the main examples. One highlight of the theory is a proof that the homotopy category of any model category is naturally a closed module over the homotopy category of simplicial sets.

Little is required of the reader beyond some category theory and set theory, making the book accessible to graduate students. The book begins with the basic theory of model categories and proceeds to a careful exposition of the main examples, using the theory of cofibrantly generated model categories. It then develops the general theory more fully, showing in particular that the homotopy category of any model category is a module over the homotopy category of simplicial sets, in an appropriate sense. This leads to a simplification and generalization of the loop and suspension functors in the homotopy category of a pointed model category. The book concludes with a discussion of the stable case, where the homotopy category is triangulated in a strong sense and has a set of small weak generators.

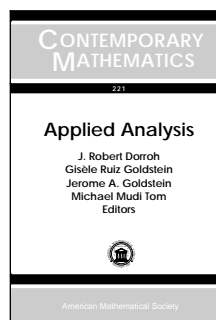
This text will also be of interest to those working in geometry and topology.

Contents: Model categories; Examples; Simplicial sets; Monoidal model categories; Framings; Pointed model categories; Stable model categories and triangulated categories; Vistas; Bibliography; Index.

Mathematical Surveys and Monographs

November 1998, 207 pages, Hardcover, ISBN 0-8218-1359-5, LC 98-34539, 1991 *Mathematics Subject Classification:* 55U35; 13D25, 16W30, 18G55, 20J05, **Individual member \$32**, List \$54, Institutional member \$43, Order code SURV-HOVEYN

Analysis



Applied Analysis

J. Robert Dorroh, *Louisiana State University, Baton Rouge*,
Gisèle Ruiz Goldstein and
Jerome A. Goldstein,
University of Memphis, TN,
and Michael Mudi Tom,
*Louisiana State University,
Baton Rouge*, Editors

This volume contains proceedings from the AMS conference on Applied

Analysis held at LSU (Baton Rouge) in April 1996. Topics include partial differential equations, spectral theory, functional analysis and operator theory, complex analysis, numerical analysis and related mathematics. Applications include quantum theory, fluid dynamics, control theory and abstract issues, such as well-posedness, asymptotics, and more.

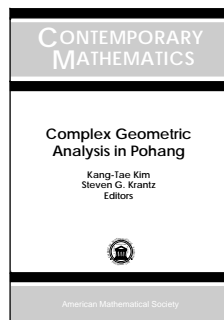
The book presents the scope and depth of the conference and its lectures. The state-of-the-art surveys by Jerry Bona and Fritz Gesztesy contain topics of wide interest. There have been a number of good conferences on related topics, yet this volume offers readers a unique, varied viewpoint. The scope of the material in the book will benefit readers approaching the work from diverse perspectives. It will serve those seeking motivational scientific problems, those interested in techniques and subspecialties and those looking for current results in the field.

Contents: J. P. Albert, Concentration compactness and the stability of solitary-wave solutions to nonlocal equations; T. Bhattacharya and A. Weitsman, Estimates for Green's function in terms of asymmetry; J. L. Bona and L. Luo, A generalized Korteweg-de Vries equation in quarter plane; A. Castro and J. W. Neuberger, An inverse function theorem; F. Gesztesy and R. Weikard, Toward a characterization of elliptic solutions of hierarchies of soliton equations; K. A. Grasse and J. R. Bar-on, Regularity of the value function for constrained optimization problems; V. Liskevich and A. Manavi, On perturbations of dominated semigroups; M. A. Park, On some nonlinear dispersive equations; Yu. A. Semenov, On perturbation theory for linear elliptic and parabolic operators; The method of Nash.

Contemporary Mathematics, Volume 221

Continued

November 1998, 284 pages, Softcover, ISBN 0-8218-0673-4, LC 98-34483, 1991 *Mathematics Subject Classification*: 34-XX, 35-XX, 47-XX, 35B40, 35Q55, 35Q53, 35Q35, 76B15, 76B25, **Individual member \$35**, List \$59, Institutional member \$47, Order code CONM/221N



Complex Geometric Analysis in Pohang

Kang-Tae Kim, Pohang University of Science and Technology (POSTECH), Korea, and **Steven G. Krantz**, Washington University, St. Louis, MO, Editors

This volume comprises the proceedings of a conference on the geometric analysis of several complex variables held at POSTECH in June 1997. The conference was attended by scientists and students from around the globe.

Each of the five plenary speakers at the conference gave a short course on a topic of current interest in the field. The lecture write-ups contain cogent and accessible information intended for a broad audience. The volume also includes a tutorial in several complex variables given by Kim and Krantz at the conference. This tutorial is geared toward helping the novice to understand the rest of the material in the book.

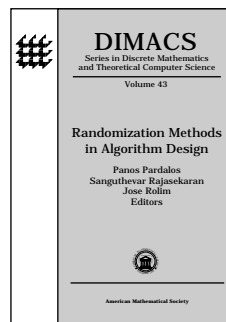
The bibliographies of the papers give students and young mathematicians a valuable resource for future learning on the topic. This book provides a substantial overview on areas of current activity. Required background for understanding the text is a solid undergraduate education in mathematics and familiarity with first-year graduate studies in real and complex analysis. Some exposure to geometry would be helpful. The book is also suitable for use as a supplemental course text.

Contents: *Survey:* **K.-T. Kim** and **S. G. Krantz**, A crash course in the function theory of several complex variables; *Plenary Lectures:* **E. Bedford** and **J. Smillie**, External rays in the dynamics of polynomial automorphisms of \mathbb{C}^2 ; **N. Mok**, G -structures on irreducible Hermitian symmetric spaces of rank ≥ 2 and deformation rigidity; **J. Noguchi**, Value distribution theory of holomorphic mappings; **J.-P. Rosay**, Automorphisms of \mathbb{C}^n , a survey of Andersén-Lempert theory and applications; *Short Talks:* **M. Abate** and **G. Patrizio**, Convex-like properties of the Teichmüller metric; **M. Abate** and **R. Tauraso**, The Julia-Wolff-Carathéodory theorem(s); **U. Backlund** and **A. Fällström**, Maximal ideals in $A(\Omega)$; **Z. Błocki**, On the regularity of the complex Monge-Ampère operator; **H. R. Cho**, L^p and H^p extensions of holomorphic functions from subvarieties; **H. Derksen** and **F. Kutzschebauch**, Global holomorphic linearization of actions of compact Lie groups on \mathbb{C}^n ; **P. M. Gauthier**, Covering properties of holomorphic mappings; **A. Hayashimoto**, On the relations between the holomorphic extendability theorems and the finiteness properties; **K.-T. Kim** and **A. F. Spiro**, Moduli space of ramified holomorphic coverings of B^2 ; **S. Kołodziej**, A sufficient condition for solvability of the Dirichlet problem for the complex Monge-Ampère operator; **M. Landucci**, Γ -invariant polynomials and proper maps; **J.-P. Rosay**, A simple proof of uniqueness for perturbations of the Mizohata operator.

Contemporary Mathematics

November 1998, approximately 264 pages, Softcover, ISBN 0-8218-0957-1, LC 98-29259, 1991 *Mathematics Subject Classification*: 32A15, 32B10, 32B20, 32C15, 32C16, 32D05, 32D15, 32E05; 32F05, 32F20, 32G08, 32H02, 32H15, 32J05, 32J15, 32L05, **Individual member \$33**, List \$55, Institutional member \$44, Order code CONM-KRANTZN

Applications



Randomization Methods in Algorithm Design

Panos Pardalos and **Sanguthevar Rajasekaran**, University of Florida, Gainesville, and **Jose Rolim**, University of Geneva, Switzerland, Editors

This volume is based on proceedings held during the DIMACS workshop on Randomization Methods in Algorithm Design in December 1997 at Princeton. The workshop was part of the DIMACS Special Year on Discrete Probability. It served as an interdisciplinary research workshop that brought together a mix of leading theorists, algorithmists and practitioners working in the theory and implementation aspects of algorithms involving randomization.

Randomization has played an important role in the design of both sequential and parallel algorithms. The last decade has witnessed tremendous growth in the area of randomized algorithms. During this period, randomized algorithms went from being a tool in computational number theory to finding widespread applications in many problem domains.

Major topics covered include randomization techniques for linear and integer programming problems, randomization in the design of approximate algorithms for combinatorial problems, randomization in parallel and distributed algorithms, practical implementation of randomized algorithms, de-randomization issues, and pseudo-random generators. This volume focuses on theory and implementation aspects of algorithms involving randomization. It would be suitable as a graduate or advanced graduate text.

This text will also be of interest to those working in probability.

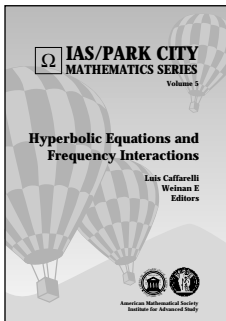
Contents: **R. D. Barve**, **E. F. Grove**, and **J. S. Vitter**, Simple randomized Mergesort on parallel disks; **R. Battiti**, **A. Bertossi**, and **R. Rizzi**, Randomized greedy algorithms for the hypergraph partitioning problem; **G. Cooperman** and **G. Havas**, Elementary algebra revisited: Randomized algorithms; **O. Goldreich**, Combinatorial property testing (a survey); **J. Gu**, Randomized and deterministic local search for SAT and scheduling problems; **K. Jansen**, An approximation scheme for scheduling of malleable parallel tasks; **D. S. Kim**, Blocking behaviors of broadcast switching networks in random traffics; **S. L. Martins**, **P. M. Pardalos**, **M. G. C. Resende**, and **C. C. Ribeiro**, Greedy randomized adaptive search procedures for the Steiner problem in graphs; **L. McShine** and **P. Tetali**, On the mixing time of the triangulation walk and other Catalan structures; **J. Mockus**, **A. Mockus**, and **L. Mockus**, Bayesian approach for randomization of heuristic algorithms of discrete

programming; **M. Molloy**, **B. Reed**, and **W. Steiger**, On the mixing rate of the triangulation walk; **I. Pak**, When and how n choose k ; **S. Rajasekaran**, Computing on optical models; **A. Sahai** and **S. Vadhan**, Manipulating statistical difference; **A. Srinivasan**, A survey of the role of multicommodity flow and randomization in network design and routing; **T. V. Theodosopoulos**, Some remarks on the optimal level of randomization in global optimization.

DIMACS: Series in Discrete Mathematics and Theoretical Computer Science, Volume 43

November 1998, 318 pages, Hardcover, ISBN 0-8218-0916-4, LC 98-34537, 1991 *Mathematics Subject Classification*: 03B05, 90A05, 68T15, 68Q42, 90C27, 90C30, 90B40, 68T01, 68Q15; 68Q22, 68Q25, 68P10, **Individual member \$41**, List \$69, Institutional member \$55, Order code DIMACS/43N

Differential Equations



Hyperbolic Equations and Frequency Interactions

Luis Caffarelli and **Weinan E.**, *Courant Institute, New York University, NY*, Editors

The research topic for this IAS/PCMS Summer Session was nonlinear wave

phenomena. Mathematicians from the more theoretical areas of PDEs were brought together with those involved in applications. The goal was to share ideas, knowledge, and perspectives.

How waves, or “frequencies”, interact in nonlinear phenomena has been a central issue in many of the recent developments in pure and applied analysis. It is believed that wavelet theory—with its simultaneous localization in both physical and frequency space and its lacunarity—is and will be a fundamental new tool in the treatment of the phenomena.

Included in this volume are write-ups of the “general methods and tools” courses held by Jeff Rauch and Ingrid Daubechies. Rauch’s article discusses geometric optics as an asymptotic limit of high-frequency phenomena. He shows how nonlinear effects are reflected in the asymptotic theory. In the article “Harmonic Analysis, Wavelets and Applications” by Daubechies and Gilbert the main structure of the wavelet theory is presented.

Also included are articles on the more “specialized” courses that were presented, such as “Nonlinear Schrödinger Equations” by Jean Bourgain and “Waves and Transport” by George Papanicolaou and Leonid Ryzhik. Susan Friedlander provides a written version of her lecture series, “Stability and Instability of an Ideal Fluid”, given at the Mentoring Program for Women in Mathematics, a preliminary program to the Summer Session.

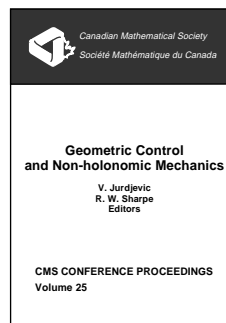
This Summer Session brought together students, fellows, and established mathematicians from all over the globe to share ideas in a vibrant and exciting atmosphere. This book presents the compelling results.

This text will also be of interest to those working in mathematical physics.

Contents: Introduction; **Jean Bourgain**, *Nonlinear Schrödinger Equations*: Introduction; Generalities and initial value problems; The initial value problem (continued); A digression: The initial value problem for the KdV equation; 1D invariant Gibbs measures; Invariant measures (2D); Quasi-periodic solutions of Hamiltonian PDE; Time periodic solutions; Time quasi-periodic solutions; Normal forms; Applications of symplectic capacities to Hamiltonian PDE; Appendix; **Ingrid C. Daubechies** and **Anna C. Gilbert**, *Harmonic Analysis, Wavelets and Applications*: Introduction; Constructing orthonormal wavelet bases: Multiresolution analysis; Wavelet bases: Construction and algorithms; More wavelet bases; Wavelets in other functional spaces; Pointwise convergence for wavelet expansions; Two-dimensional wavelets and operators; Wavelets and differential equations; References; **Susan Friedlander**, *Lectures on Stability and Instability of an Ideal Fluid*: Introduction; Equations of motion; Initial-boundary value problem; The type of the Euler equations; Vorticity; Steady flows; Stability/instability of an equilibrium state; Two-dimensional spectral problem; “Arnold” criterion for nonlinear stability; Plane parallel shear flow; Instability in a vorticity norm; Sufficient condition for instability; Exponential stretching; Integrable flows; Baroclinic instability; Nonlinear instability; References; **George Papanicolaou** and **Leonid Ryzhik**, *Waves and Transport*: Introduction; The Schrödinger equation; Symmetric hyperbolic systems; Waves in random media; The diffusion approximation; The geophysical applications; References; **Jeffrey Rauch (with the assistance of Markus Keel)**, *Lectures on Geometric Optics*: Introduction; Basic linear existence theorems; Examples of propagation of singularities and of energy; Elliptic geometric optics; Linear hyperbolic geometric optics; Basic nonlinear existence theorems; One phase nonlinear geometric optics; Justification of one phase nonlinear geometric optics; References.

IAS/Park City Mathematics Series, Volume 5

November 1998, 466 pages, Hardcover, ISBN 0-8218-0592-4, LC 98-30060, 1991 *Mathematics Subject Classification*: 35Lxx, 35Qxx, 42-XX, 73Dxx, 76-XX, **All AMS members \$55**, List \$69, Order code PCMS/5N



Geometric Control and Non-holonomic Mechanics

V. Jurdjevic and **R. W. Sharpe**, *University of Toronto, ON, Canada*, Editors

Control theory, a synthesis of geometric theory of differential equations enriched with variational principles and the associated

symplectic geometry, emerges as a new mathematical subject of interest to engineers, mathematicians, and physicists. This collection of articles focuses on several distinctive research directions having origins in mechanics and differential geometry, but driven by modern control theory.

The first of these directions deals with the singularities of small balls for problems of sub-Riemannian geometry and provides a generic classification of singularities for two-dimensional distributions of contact type in a three-dimensional ambient space.

The second direction deals with invariant optimal problems on Lie groups exemplified through the problem of Dublins

extended to symmetric spaces, the elastic problem of Kirchhoff and its relation to the heavy top. The results described in the book are explicit and demonstrate convincingly the power of geometric formalism.

The remaining directions deal with the geometric nature of feedback analyzed through the language of fiber bundles, and the connections of geometric control to non-holonomic problems in mechanics, as exemplified through the motions of a sphere on surfaces of revolution.

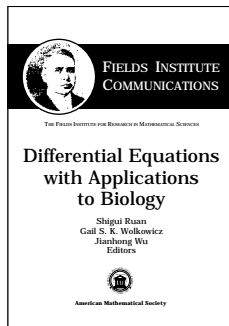
This book provides quick access to new research directions in geometric control theory. It also demonstrates the effectiveness of new insights and methods that control theory brings to mechanics and geometry.

Members of the Canadian Mathematical Society may order at the AMS member price.

Contents: V. Jurdjevic, Lie determined systems and optimal problems with symmetries; A. A. Agrachev, El-H. C. El-A., and J. P. Gauthier, Sub-Riemannian metrics on \mathbb{R}^3 ; B. Bonnard and M. Chyba, Sub-Riemannian geometry: the Martinet case; D. Mittenhuber, Dubins' problem in hyperbolic space; D. Mittenhuber, Dubins' problem in the hyperbolic plane using the open disc model; F. Monroy-Pérez, Three dimensional non-Euclidean Dubins' problem; B. Jakubczyk, Symmetries of nonlinear control systems and their symbols; J. L. F. Chapou, The motion of a sphere on a surface of revolution: a geometric approach; J. C. Martínez-García, Geometry and structure in the control of linear time invariant systems; Index.

Conference Proceedings, Canadian Mathematical Society, Volume 25

October 1998, 239 pages, Softcover, ISBN 0-8218-0795-1, LC 98-29718, 1991 *Mathematics Subject Classification*: 49-XX; 22-XX, 53-XX, **Individual member \$29**, List \$49, Institutional member \$39, Order code CMSAMS/25N



Differential Equations with Applications to Biology

Shigui Ruan, *Dalhousie University, Halifax, NS, Canada*, Gail S. K. Wolkowicz, *McMaster University, Hamilton, ON, Canada*, and Jianhong Wu, *York University,*

North York, ON, Canada, Editors

This book presents the proceedings from the International Conference held in Halifax, NS in July 1997. Funded by The Fields Institute and Le Centre de Recherches Mathématiques, the conference was held in honor of the retirement of Professors Lynn Erbe and Herb I. Freedman (University of Alberta). Featured topics include ordinary, partial, functional, and stochastic differential equations and their applications to biology, epidemiology, neurobiology, physiology and other related areas.

The 41 papers included in this volume represent the recent work of leading researchers over a wide range of subjects, including bifurcation theory, chaos, stability theory, boundary value problems, persistence theory, neural networks, disease transmission, population dynamics, pattern formation and

more. The text would be suitable for a graduate or advanced undergraduate course study in mathematical biology.

Features:

- An overview of current developments in differential equations and mathematical biology.
- Authoritative contributions from over 60 leading worldwide researchers.
- Original, refereed contributions.

This text will also be of interest to those working in applications.

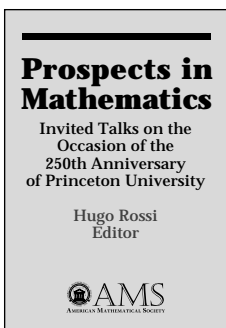
Contents: W. Allegretto and P. Nistri, On a class of nonlocal problems with applications to mathematical biology; L. J. S. Allen, E. J. Allen, and D. N. Atkinson, Integrodifference equations applied to plant dispersal, competition, and control; M. Benaïm and M. W. Hirsch, Differential and stochastic epidemic models; F. Brauer, General recruitment models for sexually transmitted diseases; J. R. Buchanan, Asymptotic behavior of two interacting pioneer/climax species; S. A. Campbell, Stability and bifurcation of a simple neural network with multiple time delays; D. Chao and S. A. Levin, Herding behavior: The emergence of large-scale phenomena from local interactions; C. J. Clements, J. C. Clements, and B. M. Horáček, On the formation of scroll waves in an anisotropic ventricular myocardium; J. C. Clements, An optimal control theory approach to the inverse problem of electrocardiography; R. Cressman, Natural selection as an extensive form game; L. Dung, H. L. Smith, and P. Waltman, Growth in the unstirred chemostat with different diffusion rates; T. Faria, Bifurcation aspects for some delayed population models with diffusion; J. E. Franke and A.-A. Yakubu, Extinction and persistence in a size-structured, discrete competitive system with dispersion; H. I. Freedman and X.-Q. Zhao, Global attractivity in a nonlocal reaction-diffusion model; P. Freitas, Nonlocal reaction-diffusion equations; T. C. Gard, Practical persistence in stochastic population models; T. Gedeon, Structure and dynamics of artificial neural networks; T. Gedeon and L. Glass, Continuity of resetting curves for FitzHugh-Nagumo equations on the circle; L. Genik and P. van den Driessche, An epidemic model with recruitment-death demographics and discrete delays; K. P. Haderl, Nonlinear propagation in reaction transport systems; U. an der Heiden, On the dynamics of nonlinear feedback loops in cell membrane, neural and sensory systems; Y. Hino and S. Murikami, Skew product flows of quasi-processes and stabilities; Y. S. Huang, Periodic solutions to system of globally coupled oscillators; Y. Kan-on, Bifurcation structure of stationary solutions of a Lotka-Volterra competition model with density-dependent diffusion; J. Kato and J. Pan, Stability domain of a chemostat system with delay; Q. Kong, Oscillation criteria for second order half-linear differential equations; Y. Kuang, Rich dynamics of Gause-type ratio-dependent predator-prey system; L. A. C. Ladeira, Differentiability with respect to delays for a neutral differential-difference equation; J. P. Lampreia, R. Severino, and J. Sousa Ramos, Renormalizations for trimodal maps; A. Lasota and M. C. Mackey, Statistical stability of strongly perturbed dynamical systems; X. Liu, A generalization of variation of parameters and Lyapunov's method; J. Milota, Persistence in an epidemiological model; Y. Morita, M. Pernarowski, and J. Dockery, Homoclinic bifurcations in a diffusively coupled excitable system; H. Petzeltová, Compactness and asymptotic spatial homogeneity in conservation laws with memory; K. Schmitt, On boundary value problems for quasilinear elliptic equations; J. F. Selgrade and P. M. Schlosser, A model for the production of ovarian hormones during the menstrual cycle; J. W.-H. So and J. S. Yu, Global stability for a general population model with time delays; H. R. Thieme and P. van den Driessche,

Global stability in cyclic epidemic models with disease fatalities; **B. Toni, D. Thieffry**, and **R. Bulajich**, Feedback loops analysis for chaotic dynamics with an application to Lorenz system; **W. Wu** and **Z. Deng**, Absolute stability of the second canonical form of control systems; **D. Xiao** and **S. Ruan**, Bogdanov-Takens bifurcations in predator-prey systems with constant rate harvesting; List of participants.

Fields Institute Communications, Volume 21

November 1998, approximately 528 pages, Hardcover, ISBN 0-8218-0944-X, 1991 *Mathematics Subject Classification*: 34-XX; 92-XX, 35-XX, 58-XX, **Individual member \$77**, List \$129, Institutional member \$103, Order code FIC/21N

General and Interdisciplinary



Prospects in Mathematics
Invited Talks on the Occasion of the 250th Anniversary of Princeton University
Hugo Rossi, *Mathematical Sciences Research Institute, Berkeley, CA*, Editor

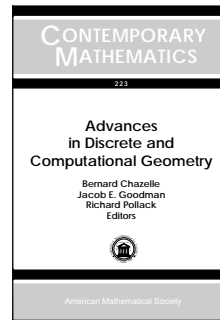
In celebration of Princeton University's 250th anniversary, the mathematics department held a conference entitled "Prospects in Mathematics". The purpose of the conference was to speculate on future directions of research in mathematics.

This collection of articles provides a rich panorama of current mathematical activity in many research areas. From Gromov's lecture on quantitative differential topology to Witten's discussion of string theory, new ideas and techniques transfixed the audience of international mathematicians. The volume contains 11 articles by leading mathematicians, including historical presentations by J. Milnor and D. Spencer. It provides a guide to some of the most significant mathematical work of this decade.

Contents: **J. Milnor**, Growing up in the Old Fine Hall; **D. Spencer**, Old memories and an old problem; **J. Fröhlich**, The electron is inexhaustible; **M. Gromov**, Quantitative homotopy theory; **H. Iwaniec**, Harmonic analysis in number theory; **D. McDuff**, Symplectic topology and capacities; **M. Struwe**, Evolution problems in geometry and mathematical physics; **E. Witten**, Small instantons in string theory; **T. Wolff**, Recent work connected with the Kakeya problem.

October 1998, 154 pages, Hardcover, ISBN 0-8218-0975-X, LC 98-36451, 1991 *Mathematics Subject Classification*: 00B20, **All AMS members \$23**, List \$29, Order code PIM-ROSSIN

Geometry and Topology



Advances in Discrete and Computational Geometry

Bernard Chazelle, *Princeton University, NJ*,
Jacob E. Goodman, *City University of New York*, and
Richard Pollack, *Courant Institute, New York University*,
 Editors

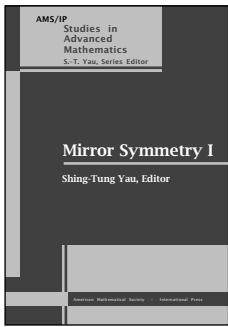
This volume is a collection of refereed expository and research articles in discrete and computational geometry written by leaders in the field. Articles are based on invited talks presented at the AMS-IMS-SIAM Summer Research Conference, "Discrete and Computational Geometry: Ten Years Later", held in 1996 at Mt. Holyoke College (So. Hadley, MA). Topics addressed range from tilings, polyhedra, and arrangements to computational topology and visibility problems. Included are papers on the interaction between real algebraic geometry and discrete and computational geometry, as well as on linear programming and geometric discrepancy theory.

This text will also be of interest to those working in applications.

Contents: **P. K. Agarwal** and **J. Erickson**, Geometric range searching and its relatives; **N. Amenta** and **G. M. Ziegler**, Deformed products and maximal shadows of polytopes; **L. J. Billera**, **C. S. Chan**, and **N. Liu**, Flag complexes, labelled rooted trees, and star shellings; **B. Chazelle**, Discrepancy bounds for geometric set systems with square incidence matrices; **T. K. Dey**, **H. Edelsbrunner**, and **S. Guha**, Computational topology; **G. F. Tóth**, Recent progress on packing and covering; **B. Grünbaum**, Acoptic polyhedra; **F. Holt** and **V. Klee**, A proof of the strict monotone 4-step conjecture; **I. Itenberg** and **M.-F. Roy**, Interactions between real algebraic geometry and discrete and computational geometry; **J. O'Rourke**, Open problems in the combinatorics of visibility and illumination; **J. Pach** and **J. Solymosi**, Halving lines and perfect cross-matchings; **J. Pach**, **T. Thiele**, and **G. Tóth**, Three-dimensional grid drawings of graphs; **M. Pocchiola** and **G. Vegter**, On polygonal covers; **J. Richter-Gebert**, The universality theorems for oriented matroids and polytopes; **M. Senechal**, Periodic and aperiodic tilings of E^n ; **M. I. Shamos**, The early years of computational geometry—A personal memoir; **M. Sharir**, Arrangements of surfaces in higher dimensions; **J. Spencer**, Geometric discrepancy theory; **H. Tverberg**, Proof of Reay's conjecture on certain positive-dimensional intersections; **R. Wenger**, Progress in geometric transversal theory; **G. M. Ziegler**, Recent progress on polytopes; **B. Chazelle**, **J. E. Goodman**, and **R. Pollack**, Application challenges to computational geometry (CG impact task force report).

Contemporary Mathematics, Volume 223

November 1998, 463 pages, Softcover, ISBN 0-8218-0674-2, LC 98-34538, 1991 *Mathematics Subject Classification*: 52-XX, 68-XX, **Individual member \$59**, List \$99, Institutional member \$79, Order code CONM/223N



Mirror Symmetry I

Shing-Tung Yau, *Harvard University, Cambridge, MA*, Editor

This volume is an updated edition of *Essays on Mirror Manifolds*, the first book of papers published after the phenomenon of mirror symmetry was discovered. The two major groups who made the discovery reported their papers here.

Greene, Plesser, and Candelas gave details on their findings; Witten gave his interpretation which was vital for future development. Vafa introduced the concept of quantum cohomology. Several mathematicians, including Katz, Morrison, Wilson, Roan, Tian, Hübsch, Yau, and Borcea discussed current knowledge about Calabi-Yau manifolds. Ferrara and his coauthors addressed special geometry and $N = 2$ supergravity. Roček proposed possible mirrors for Calabi-Yau manifolds with torsion. This collection continues to be an important book on this spectacular achievement in algebraic geometry and mathematical physics.

This text will also be of interest to those working in mathematical physics.

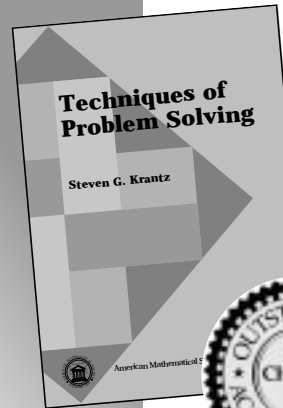
Titles in this series are co-published with International Press, Cambridge, MA.

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