

N. Bourbaki Éléments de mathématique Elements of Mathematics

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Les Éléments de mathématique – désormais édités par Springer !

Tous les volumes publiés de cette œuvre monumentale seront enfin de nouveau disponibles. Publiés pour la première fois entre 1939 et 1998, bon nombre d'entre eux étaient épuisés depuis des années. De nouveaux volumes, également publiés par Springer, viendront s'ajouter à cette collection.

L'objet de ce traité est une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements. Ouvrage de référence, ce traité a sa place dans la bibliothèque de tout mathématicien. Il est divisé en Livres et chaque Livre en Chapitres. Les Livres actuellement publiés sont les suivants :

- | | |
|------------------------------------|--------------------------------------------|
| 1. Théorie des ensembles | 6. Intégration |
| 2. Algèbre | 7. Algèbre commutative |
| 3. Topologie générale | 8. Variétés différentielles et analytiques |
| 4. Fonctions d'une variable réelle | 9. Groupes et algèbres de Lie |
| 5. Espaces vectoriels topologiques | 10. Théories spectrales |

A Toolkit for the Working Mathematician

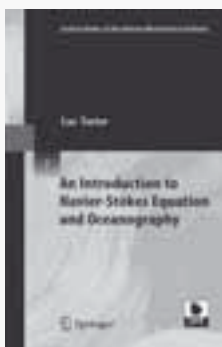
The writing of the Elements of Mathematics began in 1935. The purpose of this series is to provide a formal, systematic presentation of mathematics from their beginning. This reference work is useful to any mathematician.

English translations of the original French version published by Springer:

- | | |
|-----------------------------------|---------------------------------------|
| 1. Theory of Sets | 5. Topological Vector Spaces |
| 2. Algebra (Chapters 1–7) | 6. Integration (Chapters 1–6) |
| 3. General Topology | 7. Commutative Algebra (Chapters 1–7) |
| 4. Functions of one Real Variable | 9. Lie Groups and Lie Algebras |

Lecture Notes of the Unione Matematica Italiana

- ▶ distinguished Editorial Board including representatives of the Italian mathematical community, and equally many members from across the world, together spanning the breadth of current mathematical research.
- ▶ modelled after the well-established Lecture Notes in Mathematics (LNM) series of Springer
- ▶ published by Springer on behalf of the Unione Matematica Italiana (UMI)



An Introduction to Navier-Stokes Equation and Oceanography

L. Tartar, Carnegie Mellon University, Pittsburgh, USA

The **Introduction to Navier-Stokes Equation and Oceanography** corresponds to a graduate course in mathematics, taught at Carnegie Mellon University in the spring of 1999. Comments were added to the lecture notes distributed to the students, as well as short biographical information for all scientists mentioned in the text, the purpose being to show that the creation of scientific knowledge is an international enterprise, and who contributed to it, from where, and when. The goal of the course is to teach a critical point of view concerning the partial differential equations of continuum mechanics, and to show the need for developing new adapted mathematical tools.

2006, XXVIII, 247 p., (Lecture Notes of the Unione Matematica Italiana, Vol. 1) Softcover
ISBN 3-540-35743-2 ▶ € 39,95 | £30.50



Topics on Concentration Phenomena and Problems with Multiple Scales

A. Braides, Università di Roma 'Tor Vergata', Italy; V. Chiadò Piat, Politecnico di Torino, Italy (Eds.)

The study of variational problems showing multi-scale behaviour with oscillation or concentration phenomena are a challenging topic of very active research. This volume includes lecture notes devoted to the asymptotic analysis of such problems when the multi-scale behaviour derives from scale separation in the passage from atomistic systems to continuous functionals, from competition between bulk and surface energies, from various types of homogenization processes (random, in perforated domains, on fractals), and to concentration effects in Ginzburg-Landau energies and in subcritical growth problems.

2006, XII, 317 p., 5 illus., (Lecture Notes of the Unione Matematica Italiana, Vol. 2) Softcover
ISBN 3-540-36241-X ▶ € 49,95 | £38.50

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G. Allaire, École Polytechnique, Palaiseau, France

Conception optimale des structures

“Conception optimale des structures” est une introduction à la conception optimale de structures, appelée aussi optimisation de formes. Il est principalement destiné à un public mixte de mathématiciens appliqués et de mécaniciens que relie un même intérêt pour les applications numériques. Il traite de tous les aspects de l’optimisation de formes, paramétrique, géométrique et topologique, et fait une large place aux algorithmes numériques, méthodes de gradient et méthodes stochastiques. En particulier, la plupart des algorithmes d’optimisation de structures ont été implémentés dans le logiciel FreeFem++ d’éléments finis et les programmes sont disponibles librement sur le web.

“Conception optimale des structures” is devoted to structural or shape optimization and is intended for a mixed audience of applied mathematicians and mechanicians. It discusses parametric, geometric and topology optimization and gives deterministic and stochastic numerical algorithms.

Field of interest

Calculs des variations et contrôle optimal; optimisation

Target groups

Étudiants de Master, chercheurs, ingénieurs, doctorants

Type of publication

Manuel 2ème cycle

A. Baddeley, University of Western Australia, Nedlands, WA, Australia; I. Bárány, University College London, UK; R. Schneider, Albert-Ludwigs Universität, Freiburg i. Br., Germany; W. Weil, University of Karlsruhe, Germany

Stochastic Geometry

Lectures given at the C.I.M.E. Summer School held in Martina Franca, Italy, September 13-18, 2004

With contributions by: D. Hug, V. Capasso, E. Villa

Stochastic Geometry is the mathematical discipline which studies mathematical models for random geometric structures, as they appear frequently in almost all natural sciences or technical fields. Although its roots can be traced back to the 18th century (the Buffon needle problem), the modern theory of random sets was founded by D. Kendall and G. Matheron in the early 1970’s. Its rapid development was influenced by applications in Spatial Statistics and by its close connections to Integral Geometry. The volume “Stochastic Geometry” contains the lectures given at the CIME summer school in Martina Franca in September 2004. The four main lecturers covered the areas of Spatial Statistics, Random Points, Integral Geometry and Random Sets, they are complemented by two additional contributions on Random Mosaics and Crystallization Processes. The book presents an up-to-date description of important parts of Stochastic Geometry.

Contents

Preface.- A. Baddeley: Spatial Point Processes and their Applications.- I. Bárány: Random Polytopes, Convex Bodies, and Approximation.- W. Weil: Random Sets (in Particular Boolean Models).- D. Hug: Random Mosaics.- V. Capasso, E. Villa: On the Evolution Equations of Mean Geometric Densities for a Class of Space and Time Inhomogeneous Stochastic Birth-and-growth Processes.

Field of interest

Probability Theory and Stochastic Processes

Target groups

Researchers and graduate students

Type of publication

Collection of essays

A. Bensoussan, University of Texas at Dallas, Richardson, TX, USA; G. Da Prato, Scuola Normale Superiore, Pisa, Italy; M. C. Delfour, Université de Montréal, Canada; S. K. Mitter, Massachusetts Institute of Technology, Cambridge, MA, USA

Representation and Control of Infinite-Dimensional Systems

► *This book is a most welcome addition to the literature of this field, where it serves the need for a modern treatment on topics that only very recently have found a satisfactory solution. ... Many readers will appreciate the concise exposition. ... presents, or refers to, the most recent and updated results in the field. For this reason, it should serve as an excellent asset to anyone pursuing a research career in the field.* ► Mathematical Reviews (reviews of Volumes I and II of the First Edition)

This unified revised edition of a two-volume set is a self-contained account of quadratic cost optimal control for a large class of infinite-dimensional systems. New material and original features of the Second Edition: Part I on finite-dimensional systems contains new material. It motivates the book by providing a reorganized introduction to control of linear systems and a new chapter on linear quadratic differential games.

Features

- Original editions received outstanding reviews
- New edition is more concise and self-contained
- New material has been added to reflect the growth in the field over the past decade (e.g., applications to game theory) ► A unique chapter on semigroups theory of linear operators brings together advanced concepts and techniques that are usually treated independently

Field of interest

Systems Theory, Control

Target groups

Pure and applied mathematicians, graduate students, control engineers

Type of publication

Graduate/Advanced undergraduate textbook

A paraître octobre 2006

2007. XII, 294 p. (Mathématiques et Applications, Volume 58) Broché

► € 54,93 | £42.50

ISBN_10 ► 3-540-36710-1

ISBN_13 ► 978-3-540-36710-9



9 783540 367109

Due September 2006

2006. Approx. 300 p. (Lecture Notes in Mathematics / Fondazione C.I.M.E., Firenze, Volume 1892) Softcover

► € 39,95 | £30.50

ISBN_10 ► 3-540-38174-0

ISBN_13 ► 978-3-540-38174-7



9 783540 381747

Birkhäuser 

Due January 2007

Originally published in 2 volumes

2nd ed. 2007. Approx. 568 p. 50 illus. Hardcover

► approx. € 72,00 | £55.50

ISBN_10 ► 0-8176-4461-X

ISBN_13 ► 978-0-8176-4461-1



9 780817 644611



A. Bermúdez de Castro, D. Gómez, P. Quintela, Universidade de Santiago de Compostela, Spain; P. Salgado, Escola Politécnica Superior, Lugo, Spain (Eds.)

Numerical Mathematics and Advance Applications

Proceedings of ENUMATH 2005 the 6th European Conference on Numerical Mathematics and Advanced Applications, Santiago de Compostela, Spain, July 2005

The European Conference on Numerical Mathematics and Advanced Applications (ENUMATH) is a series of meetings held every two years to provide a forum for discussion on recent aspects of numerical mathematics and their applications. These proceedings collect the major part of the lectures given at ENUMATH 2005, held in Santiago de Compostela, Spain, from July 18 to 22, 2005. Topics include applications such as fluid dynamics, electromagnetism, structural mechanics, interface problems, waves, finance, heat transfer, unbounded domains, numerical linear algebra, convection-diffusion, as well as methodologies such as a posteriori error estimates, discontinuous Galerkin methods, multiscale methods, optimization, etc.

Field of interest

Computational Mathematics and Numerical Analysis

Target groups

Computational scientists

Type of publication

Proceedings

R. Bix, University of Michigan, Flint, MI, USA

Conics and Cubics

A Concrete Introduction to Algebraic Curves

Conics and Cubics is an accessible introduction to algebraic curves. Its focus on curves of degree at most three keeps results tangible and proofs transparent. Theorems follow naturally from high school algebra and two key ideas, homogeneous coordinates and intersection multiplicities. By classifying irreducible cubics over the real numbers and proving that their points form Abelian groups, the book gives readers easy access to the study of elliptic curves. It includes a simple proof of Bezout's Theorem on the number of intersections of two curves.

The book is a text for a one-semester course. The course can serve either as the one undergraduate geometry course taken by mathematics majors in general or as a sequel to college geometry for prospective or current teachers of secondary school mathematics. The only prerequisite is first-year calculus.

The new edition additionally discusses the use of power series to parametrize curves and analyze intersection multiplicities and envelopes.

Features

► Attractive subject area described by means of concrete and accessible examples ► A large amount of illustrations

Contents

Intersection of Curves.- Conics.- Cubics.- Intersection Properties.- References.- Index.

Field of interest

Algebraic Geometry

Target groups

Math majors, secondary school math teachers

Type of publication

Undergraduate textbook

J. F. Bonnans, J. C. Gilbert, INRIA Rocquencourt, Le Chesnay, France; C. Lemaréchal, INRIA Rhône-Alpes, Montbonnot, France; C. A. Sagastizábal, IMPA, Rio de Janeiro, Brazil

Numerical Optimization

Theoretical and Practical Aspects

Just as in its 1st edition, this book starts with illustrations of the ubiquitous character of optimization, and describes numerical algorithms in a tutorial way. It covers fundamental algorithms as well as more specialized and advanced topics for unconstrained and constrained problems. Most of the algorithms are explained in a detailed manner, allowing straightforward implementation. Theoretical aspects of the approaches chosen are also addressed with care, often using minimal assumptions.

This new edition contains computational exercises in the form of case studies which help understanding optimization methods beyond their theoretical, description, when coming to actual implementation. Besides, the nonsmooth optimization part has been substantially reorganized and expanded.

Contents

General Introduction.- Part I: Unconstraint Problems: Basic Methods; Line-Searches; Newtonian Methods; Conjugate Gradient; Special Methods.- Part II: Nonsmooth Optimization: Some Theory of Nonsmooth Optimization; Some Methods in Nonsmooth Optimization; Bundle Methods. The Quest of Decent; Decomposition and Duality.- Part III: Newton's Methods in Constrained Optimization: Background; Local Methods for Problems with Equality Constraints; Local Methods for Problems with Equality and Inequality Constraints; Exact Penalization; Globalization by Line-Search; Quasi-Newton Versions.- Part IV: Interior-Point Algorithms for Linear and Quadratic Optimization: Linearly Constrained Optimization and Simplex Algorithm; Linear Monotone Complementary and Associated Vector Fields; Predictor-Corrector Algorithms; Non-Feasible Algorithms; Self-Duality; One-Step Methods; Complexity of Linear Optimization Problems with Integer Data; Karmarkar's Algorithm.- References.- Index.

Field of interest

Operations Research, Mathematical Programming

Type of publication

Graduate/Advanced undergraduate textbook

Due September 2006

2006. Approx. 1100 p. Hardcover

► € 89,95 | £69.00

ISBN_10 ► 3-540-34287-7

ISBN_13 ► 978-3-540-34287-8



9 783540 342878

Due September 2006

2nd ed. 2006. VIII, 352 p. (Undergraduate Texts in Mathematics) Hardcover

► € 46,95 | £36.00

ISBN_10 ► 0-387-31802-X

ISBN_13 ► 978-0-387-31802-8



9 780387 318028



Due September 2006

2nd ed. 2006. XIV, 423 p. (Universitext) Softcover

► € 44,95 | £34.50

ISBN_10 ► 3-540-35445-X

ISBN_13 ► 978-3-540-35445-1



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K. Borre, D. M. Akos, N. Bertelsen, P. Rinder,
S. H. Jensen

A Software-Defined GPS and Galileo Receiver

A Single-Frequency Approach

Satellite navigation receivers are used to receive and decode satellite navigation signals, including those provided by the GPS constellation of satellites. There is an increasing need for a unified platform that will enable enhanced receiver development and design, as well as cost-effective testing procedures for various applications.

This book and accompanying DVD explore the use of such new technologies in the area of satellite navigation receivers. In order to obtain a reconfigurable receiver with a wide range of applications, the authors discuss receiver architecture based on software-defined radio techniques. The presentation unfolds in a systematic user-friendly style and goes from the basics to cutting-edge research.

Features

- Explores the use of new technologies in the area of satellite navigation receivers
- The presentation unfolds in a systematic user-friendly style and goes from the basics to cutting-edge research
- Presentation of basic signal structures used in GPS and Galileo - the European satellite navigation system

Contents

Preface.- On GPS and Galileo Signals.- GPS Signal Structure.- Galileo Signal Structure.- Front End Design and Analog Signal Conditioning.- Receiver Channel Structure.- Acquisition.- Code and Carrier Tracking.- Data Processing for Positioning.- Matlab Code.- Problems.- A. The Original Gold Paper.- B. GPS Signal Simulation.- Bibliography.- Index

Field of interest

Scientific Computing

Target groups

Applied mathematicians, electrical engineers, geodesists, graduate students, or anyone working with satellite navigation receivers

Type of publication

Graduate/Advanced undergraduate textbook

Birkhäuser 

Due September 2006

2006. Approx. 210 p. 98 illus. With DVD (Applied and Numerical Harmonic Analysis) Softcover

► approx. € 68,00 | £52.50

ISBN_10 ► 0-8176-4390-7

ISBN_13 ► 978-0-8176-4390-4



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W. Bosma, Radboud Universiteit Nijmegen, The Netherlands; J. Cannon, University of Sydney, NSW, Australia (Eds.)

Discovering Mathematics with Magma

Reducing the Abstract to the Concrete

This volume celebrates the Computer Algebra system Magma. With a design based on the ontology and semantics of algebra, Magma enables users to rapidly formulate and perform calculations in the more abstract parts of mathematics. This book introduces the reader to the role Magma plays in advanced mathematical research through 14 case studies which, in most cases, describe computations underpinning new theoretical results. The authors were chosen both for their expertise in the particular field and for their innovative use of Magma. Although by no means exhaustive, the topics range from number theory and algebraic geometry, via representation theory and group theory to some branches of discrete mathematics and graph theory. A basic introduction to the Magma language is given in an appendix.

Features

- First book on the well-known MAGMA symbolic computation system

From the contents:

Magma: the project. About this volume. How to read the Magma code?- W.Bosma: Some computational experiments in number theory.- C.Fieker: Applications of the class field theory of global fields.- N.Bruin: Some ternary Diophantine equations of signature $(n,n,2)$.- W.Stein: Studying the Birch and Swinnerton-Dyer conjecture for modular abelian varieties using Magma.- P.B.van Wamelen: Computing with the analytic Jacobian of a genus 2 curve.- G.Brown: Graded rings and special K3 surfaces.- D.E.Taylor: Constructing the split octonions.- J.F.Carlson: Support varieties for modules.- J.F.Carlson: When is projectivity detected on subalgebras?

Field of interest

Mathematical Software

Target groups

Graduate students and researchers in computer algebra and symbolic computation

Type of publication

Monograph

Due October 2006

2007. Approx. 400 p. (Algorithms and Computation in Mathematics, Volume 19) Hardcover

► € 59,95 | £46.00

ISBN_10 ► 3-540-37632-1

ISBN_13 ► 978-3-540-37632-3



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N. Bourbaki, Paris, France

Éléments de Mathématique

L'objet de cet ouvrage est une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce traité est divisé en Livres et chaque Livre en chapitres. Les Livres actuellement publiés sont les suivants: -Théorie des ensembles, -Algèbre, -Topologie générale, -Fonctions d'une variable réelle, -Espaces vectoriels topologiques, -Intégration, -Algèbre commutative, -Variétés différentiables et analytiques, -Groupes et algèbres de Lie, -Théories spectrales.

Ouvrage de référence, ce traité a sa place dans la bibliothèque de tout mathématicien.

Field of interest

Mathematics, general

Target groups

Chercheurs et étudiants

Type of publication

Monograph

Due October 2006

2006. Ensemble des 25 volumes.

► € 899,53 | £692.00

ISBN_10 ► 3-540-38358-1

ISBN_13 ► 978-3-540-38358-1



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N. Bourbaki, Paris, France

**Éléments de Mathématique.
Algèbre**

Chapitres 1 à 3

Contents

Structures algébriques.- Algèbre linéaire.- Algèbres tensorielles, algèbres, extérieures, algèbres symétriques.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Algèbre

Chapitre 4 à 7

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce deuxième volume du Livre d'Algèbre, deuxième Livre des Éléments de mathématique, traite notamment des extensions de corps et de la théorie de Galois. Il comprend les chapitres: 4. Polynômes et fractions rationnelles; 5. Corps commutatifs; 6. Groupes et corps ordonnés; 7. Modules sur les anneaux principaux.

Il contient également des notes historiques.

Ce volume est une nouvelle édition parue en 1981.

Contents

Polynômes et fractions rationnelles.- Corps commutatifs.- Groupes et corps ordonnés.- Modules sur les anneaux principaux.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Algèbre

Chapitre 9

Formes sesquilineaires et formes quadratiques Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce neuvième chapitre du Livre d'Algèbre, deuxième Livre du traité, est consacré aux formes quadratiques, symplectiques ou hermitiennes et aux groupes associés.

Il contient également une note historique.

Ce volume est une réimpression de l'édition de 1959.

Contents

Formes sesquilineaires et formes quadratiques.

Field of interest

Géométrie algébrique

Target groups

Chercheurs et étudiants

Type of publication

Monographie

En vente

Edition originale publiée par Diffusion C.C.L.S., Paris, Bourbaki, Copyright 1970

Réimpression inchangée de l'édition de 1970 2006.
Env. 600 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-33849-7

ISBN_13 ► 978-3-540-33849-9



9 783540 338499

A paraître septembre 2006

Edition originale publiée par Masson, Paris, 1981

Réimpression inchangée de l'édition de 1981 2006.
VII, 422 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-34398-9

ISBN_13 ► 978-3-540-34398-1



9 783540 343981

A paraître septembre 2006

Edition originale publiée par Hermann, Paris, 1959

Réimpression inchangée de l'édition de 1959 2006.
Env. 211 p. Broché

► € 28,39 | £22.00

ISBN_10 ► 3-540-35338-0

ISBN_13 ► 978-3-540-35338-6



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N. Bourbaki, Paris, France

Algèbre

Chapitre 10. Algèbre homologique

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce dixième chapitre du Livre d'Algèbre, deuxième Livre du traité, pose les bases du calcul homologique.

Ce volume est a été publié en 1980.

Contents

Algèbre homologique

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Algèbre commutative

Chapitres 1 à 4

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce premier volume du Livre d'Algèbre commutative, septième Livre du traité, est consacré aux concepts fondamentaux de l'algèbre commutative.

Il comprend les chapitres: 1. Modules plats; 2. Localisation; 3. Graduons, filtrations et topologies; 4. Idéaux premiers associés et décomposition primaire.

Il contient également des notes historiques.

Ce volume est une réimpression de l'édition de 1969.

Contents

Modules plats.- Localisation.- Graduons, filtrations et topologies.- Idéaux premiers associés et décomposition primaire.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Algèbre commutative

Chapitres 5 à 7

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce deuxième volume du Livre d'Algèbre commutative, septième Livre du traité, introduit deux notions fondamentales en algèbre commutative, celle d'entier algébrique et celle de valuation, qui ont de nombreuses applications en théorie des nombres et en géométrie algébrique. Il traite également des anneaux de Krull ou de Dedekind. Il comprend les chapitres: 1. Entiers; 2. Valuations; 3. Diviseurs.

Il contient également des notes historiques.

Ce volume est une réimpression de l'édition de 1965.

Contents

Entiers.- Valuations.- Diviseurs.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

A paraître septembre 2006

Edition originale publiée par Masson, Paris

Réimpression inchangée de l'édition de 1980 2006.
Env. 216 p. Broché

► € 28,39 | £22.00

ISBN_10 ► 3-540-34492-6

ISBN_13 ► 978-3-540-34492-6



9 783540 344926

A paraître septembre 2006

Edition originale publiée par Diffusion C.C.L.S., Paris, Bourbaki, Copyright 1985

Réimpression inchangée de l'édition de 1969 2006.
Env. 365 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-33937-X

ISBN_13 ► 978-3-540-33937-3



9 783540 339373

*A paraître septembre 2006*

Edition originale publiée par Masson, Paris, Bourbaki, Copyright 1985

Réimpression inchangée de l'édition de 1965 2006.
Env. 350 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-33941-8

ISBN_13 ► 978-3-540-33941-0



9 783540 339410

N. Bourbaki, Paris, France

Algèbre commutative

Chapitres 8 et 9

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce volume du Livre d'Algèbre commutative, septième Livre du traité, comprend les chapitres: 1. Dimension; 2. Anneaux locaux noethériens complets.

Le chapitre 8 traite de diverses notions de dimension en algèbre commutative, telles que la dimension de Krull d'un anneau. Ces notions jouent un rôle capital en géométrie algébrique. Le chapitre 9 introduit, quant à lui, les vecteurs de Witt et les anneaux japonais.

Ce volume est une réimpression de l'édition de 1983.

Contents

Dimension.- Anneaux locaux noethériens complets.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Algèbre commutative

Chapitre 10

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce volume du Livre d'Algèbre commutative, septième Livre du traité, est la continuation des chapitres antérieurs. Il introduit notamment les notions de profondeur et de lissité, fondamentales en géométrie algébrique. Il se termine par l'introduction des modules dualisants et de la dualité de Grothendieck.

Ce volume est paru en 1998.

Contents

Profondeur.- Régularité.- Dualité.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Eléments d'histoire des mathématiques**Contents**

Fondements des mathématiques; logique; théorie des ensembles.- Numération; analyse combinatoire.- L'évolution de l'algèbre.- Algèbre linéaire et algèbre multilinéaire.- Polynômes et corps commutatifs.- Divisibilité; corps ordonnés.- Algèbre commutative; théorie des nombres algébriques.- Algèbre non commutative.- Formes quadratiques; géométrie élémentaire.- Espaces topologiques.- Espaces uniformes.- Nombres réels.- Exponentielles et logarithmes.- Espaces à n dimensions.- Nombres complexes; mesure des angles.- Espaces métriques.- Calcul infinitésimal.- Développement asymptotiques.- La fonction gamma.- Espaces fonctionnels.- Espaces vectoriels topologiques.- Intégration dans les espaces localement compacts.- Mesure de Haar; convolution.- Intégration dans les espaces non localement compacts.- Groupes de Lie et algèbres de Lie.- Groupes engendrés par des réflexions. Systèmes de racines.

Field of interest

Histoires des mathématiques

Target groups

Chercheurs et étudiants

Type of publication

Monographie

A paraître septembre 2006

Edition originale publiée par Masson, Paris, Bourbaki, Copyright 1983

Réimpression inchangée de l'édition de 1983 2006.
Env. 200 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-33942-6

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9 783540 339427

A paraître septembre 2006

Edition originale publiée par Masson, Paris, 1998

Réimpression inchangée de l'édition de 1998 2006.
Env. 187 p. Broché

► € 28,39 | £22.00

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ISBN_13 ► 978-3-540-34394-3



9 783540 343943

En vente

Edition originale publiée par Diffusion C.C.L.S., Paris, Bourbaki, Copyright 1984

Réimpression inchangée de l'édition originale de 1984 2006. Env. 380 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-33938-8

ISBN_13 ► 978-3-540-33938-0



9 783540 339380

N. Bourbaki, Paris, France

Espaces vectoriels topologiques

Chapitres 1 à 5

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce livre est le cinquième du traité ; il est consacré aux bases de l'analyse fonctionnelle. Il contient en particulier le théorème de Hahn-Banach et le théorème de Banach-Steinhaus. Il comprend les chapitres: -1. Espaces vectoriels topologiques sur un corps valué; -2. Ensembles convexes et espaces localement convexes; -3. Espaces d'applications linéaires continues; -4. La dualité dans les espaces vectoriels topologiques; -5. Espaces hilbertiens (théorie élémentaire).

Il contient également des notes historiques.

Ce volume a été publié en 1981.

Contents

Espaces vectoriels topologiques sur un corps valué.- Ensembles convexes et espaces localement convexes.- Espaces d'applications linéaires continues.- La dualité dans les espaces vectoriels topologiques.- Espaces Hilbertiens (théorie élémentaire).

Field of interest

Topologie

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Fonctions d'une variable réelle

Théorie élémentaire

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce Livre est le quatrième du traité ; il est consacré aux bases de l'analyse réelle. Il comprend les chapitres: 1. Dérivées; 2. Primitives et intégrales; 3. Fonctions élémentaires; 4. Équations différentielles; 5. Étude locale des fonctions; 6. Développements tayloriens généralisés. 7. Formule sommatoire d'Euler-Maclaurin; 8. La fonction gamma. Il contient également des notes historiques.

Ce volume est une réimpression de l'édition de 1976.

Contents

Dérivées.- Primitives et Intégrales.- Fonctions élémentaires.- Equations différentielles.- Etude locale des fonctions.- Développements tayloriens généralisés. Formule sommatoire d'Euler-Maclaurin.

Field of interest

Fonctions réelles

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Groupes et algèbres de Lie

Chapitre 1

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce premier volume du Livre sur les Groupes et algèbre de Lie, neuvième Livre du traité, est consacré aux concepts fondamentaux pour les algèbres de Lie. Il comprend les paragraphes: §1 Définition des algèbres de Lie; §2 Algèbre enveloppante d'une algèbre de Lie; §3 Représentations; §4 Algèbres de Lie nilpotentes; §5 Algèbres de Lie résolubles; §6 Algèbres de Lie semi-simples; §7 Le théorème d'Ado.

Ce volume est une réimpression de l'édition de 1971.

Contents

Algèbres de Lie.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

A paraître septembre 2006

Edition originale publiée par Masson, Paris, 1981

Réimpression inchangée de l'édition de 1981 2006.
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ISBN_10 ► 3-540-34497-7

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9 783540 344971

A paraître septembre 2006

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Réimpression inchangée de l'édition de 1976 2006.
Env. 250 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-34036-X

ISBN_13 ► 978-3-540-34036-2



9 783540 340362

A paraître septembre 2006

Edition originale publiée par Diffusion C.C.L.S., 1971

Réimpression inchangée de l'édition de 1971 2006.
Env. 148 p. Broché

► € 28,39 | £22.00

ISBN_10 ► 3-540-35335-6

ISBN_13 ► 978-3-540-35335-5



9 783540 353355

N. Bourbaki, Paris, France

Groupes et algèbres de Lie

Chapitres 2 et 3

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce deuxième volume du Livre sur les Groupes et algèbres de Lie, neuvième Livre du traité, comprend les chapitres: 2. Algèbres de Lie libres; 3. Groupes de Lie.

Le chapitre 2 poursuit la présentation des notions fondamentales des algèbres de Lie avec l'introduction des algèbres de Lie libres et de la série de Hausdorff.

Le chapitre 3 est consacré aux concepts de base pour les groupes de Lie sur un corps archimédien ou ultramétrique.

Ce volume contient également de notes historiques pour les chapitres 1 à 3.

Ce volume est une réimpression de l'édition de 1972.

Contents

Algèbres de Lie libres.- Groupes de Lie.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Groupes et algèbres de Lie

Chapitres 4, 5 et 6

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce troisième volume du Livre sur les Groupes et algèbres de Lie, neuvième Livre du traité, est consacré aux structures de systèmes de racines, de groupes de Coxeter et de systèmes de Tits, qui apparaissent naturellement dans l'étude des groupes de Lie analytique ou algébriques. Il comprend les chapitres: -Groupes de Coxeter et systèmes de Tits, -Groupes engendrés par des réflexions, -Systèmes de racines.

Ce volume contient également des planches décrivant les différents types de systèmes de racines et des notes historiques.

Ce volume est une réimpression de l'édition de 1968.

Contents

Groupes de Coxeter et système de Tits.- Groupes engendrés par des réflexions.- Systèmes de racines.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Groupes et algèbres de Lie

Chapitres 7 et 8

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce troisième volume du Livre sur les Groupes et algèbres de Lie, neuvième Livre du traité, poursuit l'étude des algèbres de Lie et leurs représentations. Il comprend les chapitres: 7. Sous-algèbres de Cartan, éléments réguliers; 8. Algèbres de Lie semi-simples déployées.

Ce volume contient également un appendice sur la topologie de Zariski.

Ce volume est une réimpression de l'édition de 1975.

Contents

Sous-algèbres de Cartan.- Éléments réguliers.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

A paraître septembre 2006

Edition originale publiée par Diffusion C.C.L.S., Paris, 1972

Réimpression inchangée de l'édition de 1972 2006.
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ISBN_10 ► 3-540-33940-X

ISBN_13 ► 978-3-540-33940-3



9 783540 339403

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Edition originale publiée par Hermann, Paris, 1968

Réimpression inchangée de l'édition de 1968 2006.
Env. 288 p. Broché

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ISBN_10 ► 3-540-34490-X

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9 783540 344902

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Edition originale publiée par Masson, Paris, 1990

Réimpression inchangée de l'édition de 1975 2006.
Env. 270 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-33939-6

ISBN_13 ► 978-3-540-33939-7



9 783540 339397

N. Bourbaki, Paris, France

Groupes et algèbres de Lie**Chapitre 9**

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce neuvième chapitre du Livre sur les Groupes et algèbres de Lie, neuvième Livre du traité, comprend les paragraphes: §1 Algèbres de Lie compactes; §2 Tores maximaux des groupes de Lie compactes; §3 Fromes compactes des algèbres de Lie semi-simples complexes; §4 Système de raciness associé à un groupe compact; §5 Classes de conjugaison; §6 Intégration dans les groupes de Lie compactes; §7 Représentations irréductibles des groupes de Lie compactes connexes; §8 Transformation de Fourier; §9 Opération des groupes de Lie compactes sur les variétés.

Ce volume a été publié en 1982.

Contents

Groupes de Lie réels compacts.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Intégration**Chapitres 1-4**

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce premier volume du Livre d'Intégration, sixième Livre du traité, est consacré aux fondements de la théorie de l'intégration, il comprend les chapitres:

Inégalités de convexité;

Espaces de Riesz;

Mesures sur les espaces localement compacts;

Prolongement d'une mesure. Espaces L_p .

Il contient également une note historique.

Ce volume est une réimpression de l'édition de 1965.

Contents

Inégalités de convexité.- Espaces de Riesz.-

Mesures sur les espaces localement compacts.-

Prolongement d'une mesure espaces L_p .

Field of interest

Mesure et integration

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Intégration**Chapitre 5**

Intégration 5.-

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce cinquième chapitre du Livre d'Intégration, sixième Livre des éléments de mathématique, traite notamment d'une generalisation du théorème de Lebesgue-Fubini et du théorème de Lebesgue-Nikodym.

Il contient également des notes historiques.

Ce volume est une réimpression de l'édition de 1967.

Contents

Intégration des mesures.

Field of interest

Mesure et integration

Target groups

Chercheurs et étudiants

Type of publication

Monographie

A paraître septembre 2006

Edition originale publiée par Masson, Paris, 1982

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Env. 138 p. Broché

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ISBN_10 ► 3-540-34392-X

ISBN_13 ► 978-3-540-34392-9



9 783540 343929

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Edition originale publiée par Hermann, Paris, 1973

Réimpression inchangée de l'édition de 1965 2006.
Env. 283 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-35328-3

ISBN_13 ► 978-3-540-35328-7



9 783540 353287

A paraître septembre 2006

Edition originale publiée par Hermann, Paris, 1967

Réimpression inchangée de l'édition de 1967 2006.
Env. 154 p. Broché

► € 28,39 | £22.00

ISBN_10 ► 3-540-35333-X

ISBN_13 ► 978-3-540-35333-1



9 783540 353331

N. Bourbaki, Paris, France

Intégration**Chapitre 6**

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce sixième chapitre du Livre d'Intégration, sixième Livre des éléments de mathématique, étend la notion d'intégration à des mesure à valeurs dans des espaces vectoriels de Hausdorff localement convexes.

Il contient également une note historique.

Ce volume est une réimpression de l'édition de 1959.

Contents

Intégration vectorielle.

Field of interest

Mesure et integration

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Intégration**Chapitres 7-8**

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce volume du Livre d'Intégration, sixième Livre du traité, traite de l'intégration sur les groupes localement compacts et de ses applications. Les notions introduites, telles que les mesures de Haar et le produit de convolution, sont à la base de l'analyse harmonique. Il comprend les chapitres: -1. Mesure de Haar; -2. Convolution et représentations.

Il contient également des notes historiques.

Ce volume est une réimpression de l'édition de 1963.

Contents

Mesure de Haar.- Concolution et représentations.

Field of interest

Théorie des groupes

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

**Éléments de Mathématique.
Intégration****Chapitre 9**

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce neuvième chapitre du Livre d'Intégration, sixième Livre des éléments de mathématique, est consacré à l'intégration dans les espaces topologiques séparés non nécessairement localement compacts, ce qui permet d'étendre la théorie de la transformation de Fourier aux espaces vectoriels localement convexes.

Ce chapitre introduit également la mesure de Wiener qui intervient dans le cadre de l'étude du mouvement brownien.

Il contient une note historique.

Ce volume a été publié en 1969.

Contents

Mesures sur les espaces topologiques séparés.

Field of interest

Analyses fonctionnelles

Target groups

Chercheurs et étudiants

Type of publication

Monographie

A paraître septembre 2006

Edition originale publiée par Hermann, Paris, 1960

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9 783540 353195

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Edition originale par Hermann, Paris, Bourbaki, 1963

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Env. 222 p. Broché

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9 783540 353249

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Edition originale publié par Diffusion C.C.L.S., Paris, 1969

Réimpression inchangée de l'édition de 1969 2006.
Env. 133 p. Broché

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ISBN_10 ► 3-540-34390-3

ISBN_13 ► 978-3-540-34390-5



9 783540 343905

N. Bourbaki, Paris, France

Théorie des ensembles

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Le Livre de Théorie des ensembles qui vient en tête du traité présente les fondements axiomatiques de la théorie des ensembles. Il comprend les chapitres: 1. Description de la mathématique formelle; 1. Théorie des ensembles; 2. Ensembles ordonnés. Cardinaux. 3. nombres entiers; 4. Structures. Il contient également un fascicule de résultats et une note historique.

Ce volume est une réimpression de l'édition de 1970.

Contents

Eléments et parties d'un ensemble.- Fonctions.- Produit de plusieurs ensembles.- Réunion, intersection, produit d'une famille d'ensembles.- Relations d'équivalence; ensemble quotient.- Ensembles ordonnés.- Puissances, ensembles dénombrables.- Echelles d'ensembles et structures.

Field of interest

Fondements et logiques mathématiques

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Théories spectrales

Chapitres 1-2

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce premier volume du Livre consacré aux Théorie spectrales, dernier Livre du traité, comprend les chapitres: -1. Algèbres normées; -2. Groupes localement compacts commutatifs.

Le premier chapitre introduit des concepts de base en analyse fonctionnelle. Le deuxième chapitre a pour aboutissement la transformation de Fourier sur les groupes localement compacts commutatifs. Ce volume est une réimpression de l'édition de 1967.

Contents

Algèbres normées.- Groupes localement compacts commutatifs.

Field of interest

Analyses fonctionnelles

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Topologie générale

Chapitres 1-4

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce premier volume du Livre de Topologie générale, troisième Livre du traité, est consacré aux structures fondamentales en topologie, qui constituent les fondements de l'analyse et de la géométrie. Il comprend les chapitres: 1. Structures topologiques; 2. Structures uniformes; 3. Groupes topologiques; 4. Nombres réels.

Il contient également des notes historiques.

Ce volume est une réimpression de l'édition de 1971.

Contents

Structures topologiques.- Structures uniformes.- Groupes topologiques.- Nombres réels.

Field of interest

Topologie

Target groups

Chercheurs et étudiants

Type of publication

Monographie

A paraître septembre 2006

Edition originale publiée par Diffusion C.C.L.S., Paris, nouveau tirage 1977, Bourbaki, Copyright 1970

Réimpression inchangée de l'édition de 1970 2006.
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9 783540 340348

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9 783540 353300

A paraître septembre 2006

Edition originale publiée par Diffusion C.C.L.S., Paris, 1971

Réimpression inchangée de l'édition de 1971 2006.
Env. 350 p. Broché

► € 47,35 | £36.50

ISBN_10 ► 3-540-33936-1

ISBN_13 ► 978-3-540-33936-6



9 783540 339366

N. Bourbaki, Paris, France

Topologie Générale

Chapitres 5 à 10

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce deuxième volume du Livre de Topologie générale, troisième Livre du traité, décrit de nombreux outils fondamentaux en topologie et en analyse, tels que le théorème d'Urysohn, le théorème de Baire ou les espaces polonais. Il comprend les chapitres: 1. Groupes à un paramètre; 2. Espaces numériques et espaces projectifs; 3. Les groupes additifs \mathbb{R}^n ; 4. Nombres complexes; 5. Utilisation des nombres réels en topologie générale; 6. Espaces fonctionnels. Il contient également des notes historiques. Ce volume a été publié en 1974.

Contents

Groupes à un paramètre.- Espaces numériques et espaces projectifs.- Les groupes additifs \mathbb{R}^n . Nombres complexes.- Utilisation des nombres réels en topologie générale.- Espaces fonctionnels.

Field of interest

Topologie

Target groups

Chercheurs et étudiants

Type of publication

Monographie

N. Bourbaki, Paris, France

Variétés différentielles et analytiques

Fascicule de résultats

Les Éléments de mathématique de Nicolas Bourbaki ont pour objet une présentation rigoureuse, systématique et sans prérequis des mathématiques depuis leurs fondements.

Ce fascicule rassemble les notions fondamentales et les principaux résultats de la théorie des variétés différentiables (sur le corps des nombres réels) et des variétés analytiques (sur un corps value complet non discret). Il ne contient pas de démonstration.

Ce volume est une réimpression des éditions de 1967 et 1971.

Contents

Variétés différentielles et analytiques.

Target groups

Chercheurs et étudiants

Type of publication

Monographie

D. S. Bridges, L. S. Vita, University of Canterbury, Christchurch, New Zealand

Techniques of Constructive Analysis

This book is an introduction to constructive mathematics with an emphasis on techniques and results that have been obtained in the last twenty years. The text covers fundamental theory of the real line and metric spaces, focusing on locatedness in normed spaces and with associated results about operators and their adjoints on a Hilbert space. There are two appendices to the book. The first gathers together some basic notions about sets and orders, the second gives the axioms for intuitionistic logic. The intended readership of the book consists of senior undergraduate and graduate students, as well as professional research mathematicians. No background in intuitionistic logic or constructive analysis is needed in order to read the book, but some familiarity with the classical theories of metric, normed and Hilbert spaces is necessary.

Features

► Only book to deal with developments in Bishop-style constructive analysis over the past 20 years ► Specific focus on techniques and themes, and includes many simplified or improved proofs ► Instead of using classical logic, author uses intuitionistic logic ► Computer scientists interested in implementing mathematics will find it a good source of proofs from which to extract programs

Contents

Preface.- Introduction to Constructive Mathematics.- Techniques of Elementary Analysis.- The Lambda Technique.- Finite-Dimensional and Hilbert Spaces.- Linearity and Convexity.- Operators and Locatedness.- References.- Index.

Field of interest

Mathematical Logic and Foundations

Target groups

Postgraduate or senior undergraduate students, professional research mathematicians

Type of publication

Graduate/Advanced undergraduate textbook

A paraître septembre 2006

Edition originale publiée par Masson, Paris, 1974

Réimpression inchangée de l'édition de 1974 2006.
Env. 336 p. Broché

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ISBN_10 ► 3-540-34399-7

ISBN_13 ► 978-3-540-34399-8



9 783540 343998

A paraître septembre 2006

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Réimpression inchangée de l'éditions de 1967 et 1971
2006. Env. 99 p. Broché

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ISBN_13 ► 978-3-540-34396-7



9 783540 343967

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2006. Approx. 260 p. (Universitext) Softcover

► € 39,95 | £30.50

ISBN_10 ► 0-387-33646-X

ISBN_13 ► 978-0-387-33646-6



9 780387 336466



C. Calgari, J. Coulombel, T. Goudon, Université de Lille, Villeneuve, France (Eds.)

Analysis and Simulation of Fluid Dynamics

This volume collects the contributions of a Conference held in June 2005 at the laboratoire Paul Painlevé (UMR CNRS 8524) in Lille, France. The meeting was intended to review hot topics and future trends in fluid dynamics, with the objective to foster exchanges of various viewpoints (e.g. theoretical, and numerical) on the addressed questions.

Features

► Collection of research articles on recent advances in the analysis and simulation of fluid dynamics ► Reviews hot topics and future trends in fluid dynamics ► Fosters exchanges between theoretical and numerical viewpoints ► Contains contributions by leading experts on mathematical analysis, asymptotics problems, numerical schemes and physics ► Concerns compressible and incompressible models

Field of interest

Partial Differential Equations

Target groups

Researchers, graduate students

Type of publication

Proceedings

F. Catanese, University of Bayreuth, Germany; H. Esnault, University of Essen, Germany; A. T. Huckleberry, Ruhr-University Bochum, Germany; K. Hulek, University of Hannover, Germany; T. Peternell, University of Bayreuth, Germany (Eds.)

Global Aspects of Complex Geometry

This collection of surveys present an overview of recent developments in Complex Geometry. Topics range from curve and surface theory through special varieties in higher dimensions, moduli theory, Kähler geometry, and group actions to Hodge theory and characteristic p-geometry. Written by established experts this book will be a must for mathematicians working in Complex Geometry.

Features

► Unique collection of surveys on recent developments in Complex Geometry

Field of interest

Algebraic Geometry

Target groups

Mathematicians

Type of publication

Monograph

G. V. Demidenko, V. L. Vaskevich, Sobolev Institute of Mathematics, Novosibirsk, Russia (Eds.)

Selected Works of S.L. Sobolev

Volume I: Equations of Mathematical Physics, Computational Mathematics, and Cubature Formulas

S.L. Sobolev (1908–1989) was a great mathematician of the twentieth century. His selected works included in this volume laid the foundations for intensive development of the modern theory of partial differential equations and equations of mathematical physics, and they were a gold mine for new directions of functional analysis and computational mathematics.

The topics covered in this volume include Sobolev's fundamental works on equations of mathematical physics, computational mathematics, and cubature formulas. Some of the articles are generally unknown to mathematicians because they were published in journals that are difficult to access.

Features

► First appearance in English of many works by important Russian mathematician S.L. Sobolev (1908–1989)

From the contents:

Academician S. L. Sobolev is a Founder of New Directions of Functional Analysis (by Yu. G. Reshetnyak).- Part I. Equations of Mathematical Physics.- 1. Application of the Theory of Plane Waves to the Lamb Problem.- 2. On a New Method in the Plane Problem on Elastic Vibrations.- 3. On Application of a New Method to Study Elastic Vibrations in a Space with Axial Symmetry.- 4. On Vibrations of a Half-Plane and a Layer with Arbitrary Initial Conditions.- 5. On a New Method of Solving Problems about Propagation of Vibrations.- 6. Functionally Invariant Solutions of the Wave Equation.- 7. General Theory of Diffraction of Waves on Riemann Surfaces.

Field of interest

Partial Differential Equations

Target groups

Mathematicians, especially those interested in Mechanics and Physics, and graduate and post-graduate students in Mathematics and Physics departments

Type of publication

Collected works

Birkhäuser 

Due October 2006

2006. Approx. 212 p. (Advances in Mathematical Fluid Mechanics) Hardcover

► € 58,00 | £44.50

ISBN_10 ► 3-7643-7741-0

ISBN_13 ► 978-3-7643-7741-0



9 783764 377410



Due September 2006

2006. VIII, 506 p. 15 illus. Hardcover

► € 79,95 | £61.50

ISBN_10 ► 3-540-35479-4

ISBN_13 ► 978-3-540-35479-6



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Due September 2006

2006. Approx. 705 p. Hardcover

► € 99,95 | £77.00

ISBN_10 ► 0-387-34148-X

ISBN_13 ► 978-0-387-34148-4



9 780387 341484



V. Dragan, T. Morozan, Institute of Mathematics at the Romanian Academy, Bucharest, Romania; A. Stoica, University „Politehnica“ of Bucharest, Romania

Mathematical Methods in Robust Control of Linear Stochastic Systems

Linear stochastic systems are successfully used to provide mathematical models for real processes in fields such as aerospace engineering, communications, manufacturing, finance and economy. This monograph presents a useful methodology for the control of such stochastic systems with a focus on robust stabilization in the mean square, linear quadratic control, the disturbance attenuation problem, and robust stabilization with respect to dynamic and parametric uncertainty. Systems with both multiplicative white noise and Markovian jumping are covered.

Key Features: Covers the necessary pre-requisites from probability theory, stochastic processes, stochastic integrals and stochastic differential equations. Includes detailed treatment of the fundamental properties of stochastic systems subjected both to multiplicative white noise and to jump Markovian perturbations. Systematic presentation leads the reader in a natural way to the original results.

Features

► Covers the necessary pre-requisites from probability theory, stochastic processes, stochastic integrals and stochastic differential equations ► Includes detailed treatment of the fundamental properties of stochastic systems subjected both to multiplicative white noise and to jump Markovian perturbations ► Systematic presentation leads the reader in a natural way to the original results

Field of interest

Systems Theory, Control

Target groups

Graduate students, researchers in advanced control engineering, mathematical systems theory and finance, numerical analysis

Type of publication

Monograph

Due September 2006

2006. XII, 312 p. 2 illus. (Mathematical Concepts and Methods in Science and Engineering, Volume 50) Hardcover

► € 62,95 | £48.50
ISBN_10 ► 0-387-30523-8
ISBN_13 ► 978-0-387-30523-3



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B. Duplantier, CEA Saclay, Gif-sur-Yvette, France; J. Raimond, ENS Paris, France; V. Rivasseau, Université Paris XI, France (Eds.)

Quantum Decoherence

Poincaré Seminar 2005

The Poincaré Seminar is held twice a year at the Institute Henri Poincaré in Paris. The goal of this seminar is to provide up-to-date information about general topics of great interest in physics. Both the theoretical and experimental results are covered, with some historical background. Particular care is devoted to the pedagogical nature of the presentation. This volume is devoted to Quantum Decoherence. A broad perspective on the subject is provided by the contributions of W. H. Zurek, H. D. Zeh and E. Joos, together with clean up-to-date presentations of the actual experiments on decoherence both in the mesoscopic systems of atomic physics, by J.M. Raimond and S. Haroche, and in the „quantronic“ or condensed matter context, by D. Esteve et al. Further, the question of quantum codes and error corrections is discussed in the contribution of J. Kempe.

Features

► Lectures from the Séminaire Poincaré, held in November 2005 at the Institute Henri Poincaré Paris ► Fascinating topic between experimental and theoretical physics, with applications to computer science

Contents

Preface.- Decoherence and the Transition from Quantum to Classical - Revisited.- Monitoring the Decoherence of Mesoscopic Quantum Superpositions in a Cavity.- Dynamical Consequences of Strong Entanglement.- Decoherence of a Quantum Bit Circuit.- Approaches to Quantum Error Correction.- Roots and Fruits of Decoherence.

Field of interest

Applications of Mathematics

Target groups

Graduates, postgraduates and researchers in Mathematical Physics, Quantum Physics or Computer Science

Type of publication

Collection of essays

Birkhäuser

Due September 2006

2006. Approx. 200 p. (Progress in Mathematical Physics, Volume 48) Hardcover

► € 68,00 | £52.50
ISBN_10 ► 3-7643-7807-7
ISBN_13 ► 978-3-7643-7807-3



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M. Emmer, Università La Sapienza, Roma, Italy (Ed.)

Mathematics and Culture V

Translated from the Italian by: K. Williams

This volume of the “Mathematics and Culture” series is dedicated to Italian artist Armando Pizzicato. The work of Pollock is also discussed, thanks to the collaboration of the Venice Guggenheim Collection. Mathematics creates beauty in architecture, from topology to the projects of Gehry and Piano to the muqarnas of Islam. The fourth dimension is made visible in these pages.

But mathematics can save lives as well. Mathematical models can fight against cancer and AIDS, prevent their spread and intervene in their cure. Mathematics can also be used to protect the environment. In the wake of the devastation caused by Hurricane Katrina, the discussion of the use of mathematical models in meteorology and the prediction of storms is particularly timely. This volume wouldn't be complete without Venice and its glass, the fantastic collection of murrine of Giovanni Sarpellon.

There is even a bit of magic, thanks to Bustric. And finally, an homage to a great mathematician: H.S.M. “Donald” Coxeter.

Features

► Mathematics highlight of general interest

From the contents:

M. Emmer: H.M.S. Coxeter: A Brief Tribute.- S.Roberts, A.I.Weiss: Donald in Wonderland: The Many-Faceted Life of H.S.M.Coxeter.- F. Ghione: Vision and Reality: Empiricism and Geometry.- G.M. Todesco: Stars.- G. Sarpellon: An Arbitrarily Small Epsilon: The Murrine of Venice and Murano.- E. Cordero: Mathematical Models for Meteorology.- G. Peggion: The Mathematics in defense of the environment.- J.M. Castera: The Mouqarnas of the Hall of the Two Sisters in the Alhambra in Granada.

Field of interest

Mathematics, general

Target groups

Mathematicians, teachers, students, and researchers

Type of publication

Undergraduate textbook

Due October 2006

Original Italian edition published by Springer-Verlag Italia, Milano, 2005

2007. Approx. 300 p. Hardcover

► € 49,95 | £38.50
ISBN_10 ► 3-540-34277-X
ISBN_13 ► 978-3-540-34277-9



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G. P. Galdi, University of Pittsburgh, PA, USA;
R. Rannacher, University of Heidelberg, Germany;
A. M. Robertson, University of Pittsburgh, PA, USA;
S. Turek, University of Dortmund, Germany

Hemodynamical Flows

Modeling, Analysis and Simulation

This book surveys results on the physical and mathematical modeling as well as the numerical simulation of hemodynamical flows, i.e., of fluid and structural mechanical processes occurring in the human blood circuit. The topics treated are continuum mechanical description, choice of suitable liquid and wall models, mathematical analysis of coupled models, numerical methods for flow simulation, parameter identification and model calibration, fluid-solid interaction, mathematical analysis of piping systems, particle transport in channels and pipes, artificial boundary conditions, and many more. Hemodynamics is an area of active current research, and this book provides an entry into the field for graduate students and researchers. It has grown out of a series of lectures given by the authors at the Oberwolfach Research Institute in November, 2005.

Features

► Written by an interdisciplinary group of experts from mechanical engineering, mathematical analysis, and numerics ► Subject is treated from different points of view representing the state of the art in their field, guaranteeing a good degree of theoretical soundness and practical relevance of the material presented

From the contents

Preface.- Continuum mechanical description of blood flow.- Mechanical models of blood vessel walls.- Analysis of Newtonian and non-Newtonian fluid models.- Numerical methods for flow simulation.- Aspects of mesh and model adaptivity.- Particle transport in viscous flows.- Flows through systems of pipes.

Field of interest

Applications of Mathematics

Target groups

Graduate students and researchers

Type of publication

Graduate/Advanced undergraduate textbook

Birkhäuser 

Due January 2007

2007. Approx. 400 p. (Oberwolfach Seminars, Volume 35) Softcover

► € 38,00 | £29.00

ISBN_10 ► 3-7643-7805-0

ISBN_13 ► 978-3-7643-7805-9



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B. Gärtner, ETH, Zurich, Switzerland; J. Matousek, Charles University, Prague, Czech Republic

Understanding and Using Linear Programming

The book is an introductory textbook mainly for students of computer science and mathematics. Our guiding phrase is "what every theoretical computer scientist should know about linear programming". A major focus is on applications of linear programming, both in practice and in theory. The book is concise, but at the same time, the main results are covered with complete proofs and in sufficient detail, ready for presentation in class. The book does not require more prerequisites than basic linear algebra, which is summarized in an appendix. One of its main goals is to help the reader to see linear programming "behind the scenes".

Features

► Elementary, excellently written textbook on linear programming for a very wide-ranging readership

From the contents:

Preliminary.- 1 What is it, and what for?- 2 Examples.- 3 Integer Programming and LP Relaxation.- 4 Theory of Linear Programming: First Steps.- 5 The Simplex Method.- 6 Duality of Linear Programming.- 7 Not Only the Simplex Method.- 8 More Applications.- 9 Software and Further Reading.

Field of interest

Optimization

Target groups

Students and researchers in Computer Science, Mathematics, Engineering Disciplines and Mathematical Economy

Type of publication

Undergraduate textbook

Due September 2006

2006. VIII, 222 p. (Universitext) Softcover

► € 39,95 | £30.50

ISBN_10 ► 3-540-30697-8

ISBN_13 ► 978-3-540-30697-9



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A. Isaev, Australian National University, Canberra, ACT, Australia

Introduction to Mathematical Methods in Bioinformatics

This book looks at the mathematical foundations of the models currently in use. This is crucial for the correct interpretation of the outputs of the models. A bioinformatician should be able not only to use software packages, but also to know the mathematics behind these packages.

From this point of view, mathematics departments throughout the world have a major role to play in bioinformatics education by teaching courses on the mathematical foundations of the subject. Based on the courses taught by the author the book combines several topics in biological sequence analysis with mathematical and statistical material required for such analysis.

Features

► All existing books on bioinformatics are software-oriented, they concentrate on computer implementations of mathematical models of biology ► Unique in the sense that it looks at the mathematical foundations of the models, which are crucial for correct interpretation of the outputs of the models

Contents

Introduction: Biological Sequences.- Sequence Alignment.- Markov Chains and Hidden Markov Models.- Protein Folding.- Phylogenetic Reconstruction.- Elements of Probability Theory.- Significance of Sequence Alignment Scores.- Elements of Statistics.- Substitution Matrices.- Exercises.- Bibliography.- Index.

Field of interest

Bioinformatics

Target groups

Students and lecturers in Bioinformatics, Biological Sequence Analysis, Biological Mathematics, Mathematics, Statistics, and Genetics

Type of publication

Graduate/Advanced undergraduate textbook

Available

Advertised in Springer News 06/2004

1st ed. 1994. Corr. print. 2006. XIII, 294 p. 77 illus. (Universitext) Softcover

► € 49,95 | £38.50

ISBN_10 ► 3-540-21973-0

ISBN_13 ► 978-3-540-21973-6



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W. Jäger, R. Rannacher, J. Warnatz, IWR Heidelberg, Germany (Eds.)

Reactive Flow, Diffusion and Transport

From Experiments via Mathematical Modeling to Numerical Simulation and Optimization

The articles in this volume summarize the research results obtained in the former SFB 359 "Reactive Flow, Diffusion and Transport" which has been supported by the DFG over the period 1993-2004. The main subjects are physical-chemical processes sharing the difficulty of interacting diffusion, transport and reaction which cannot be considered separately. Typical examples are the chemical processes in flow reactors and in the catalytic combustion at surfaces. Further examples are models of star formation including diffusive mass transport, energy radiation and dust formation and the polluting transport in soil and waters. For these complex processes mathematical models are established and numerically simulated. The modeling uses multiscale techniques for nonlinear differential equations while for the numerical simulation and optimization goal-oriented mesh and model adaptivity, multigrid techniques and advanced Newton-type methods are developed combined with parallelization.

Field of interest

Scientific Computing

Target groups

Computational scientists

Type of publication

Proceedings

S. Jørgensen, University of Southern Denmark, Odense, Denmark; M. Quincampoix, Université de Bretagne Occidentale, Brest, France; T. Vincent, University of Arizona, Tucson, AZ, USA (Eds.)

Advances in Dynamic Game Theory and Applications

This collection of selected contributions gives an account of recent developments in dynamic game theory and its applications, covering a broad range of topics. Written by experts in their respective disciplines, the chapters are an outgrowth of presentations from the 11th International Symposium on Dynamic Games and Applications. Key topics covered include: stochastic and differential games, applications of dynamic games in various areas, such as economics, marketing, and finance, numerical methods and algorithms for solving dynamic games, zero-sum and pursuit-evasion games.

Features

► Collection of selected contributions giving an account of recent developments in dynamic game theory and its applications ► Covers a broad range of topics: stochastic and differential games; applications of dynamic games in various areas, such as economics, marketing, and finance; numerical methods and algorithms for solving dynamic games; zero-sum and pursuit-evasion games

Contents

Preface.- Contributors.- Stochastic Games.- Differential Games.- Applications of Dynamic Games.- Numerical Methods and Algorithms for Solving Dynamic Games.- Zero-Sum Games.- Pursuit-Evasion Games.

Field of interest

Game Theory, Economics, Social and Behavioral Sciences

Target groups

Applied mathematicians, engineers, and advanced graduate students

Type of publication

Contributed volume

P. Markowich, University of Vienna, Austria

Applied Partial Differential Equations: A Visual Approach

This book presents selected topics in science and engineering from an applied-mathematics point of view. The described natural, socioeconomic, and engineering phenomena are modeled by partial differential equations that relate state variables such as mass, velocity, and energy to their spatial and temporal variations. Typically, these equations are highly nonlinear; in many cases they are systems, and they represent challenges even for the most modern and sophisticated mathematical and numerical-analytic techniques. The selected topics reflect the longtime scientific interests of the author. They include flows of fluids and gases, granular-material flows, biological processes such as pattern formation on animal skins, kinetics of rarified gases, free boundaries, semiconductor devices, and socioeconomic processes.

Features

► Shows that partial differential equations model many aspects of our natural surroundings ► Beautiful photographs give a memorable and unique access to the different applications discussed in the book ► Addresses a broad audience: from mathematically oriented science-engineering students to scientists-engineers with a mathematical background ► Outstanding "coffee-table" book with non-trivial maths contents

Contents

Fluid and Gas Dynamics.- Granular Gas Dynamics.- Chemotaxis and Pattern Formation in Animals.- Reaction-Diffusion Equations - Structured Environments.- Kinetics of Rarified Gases: The Boltzmann Equation.- Semiconductor Modelling.- Optimal Transport and Monge-Ampere Equations.- Wave Equations.- Digital Image Processing and Analysis.- Partial Differential Equations in Glacier Physics.- Free Boundaries and Interfaces: the Stefan Problem.

Field of interest

Applications of Mathematics

Target groups

Students and researchers in Mathematics, in Science and Engineering with a mathematical background

Type of publication

Undergraduate textbook

Birkhäuser 

Due December 2006

2006. Approx. 736 p. 190 illus. (Annals of the International Society of Dynamic Games, Volume 9) Hardcover

► approx. € 98,00 | £75.50

ISBN_10 ► 0-8176-4399-0

ISBN_13 ► 978-0-8176-4399-7

Due September 2006

2006. Approx. 700 p. Hardcover

► € 99,95 | £77.00

ISBN_10 ► 3-540-28379-X

ISBN_13 ► 978-3-540-28379-9

Due September 2006

2006. Approx. 160 p. With CD-ROM. Hardcover

► € 62,95 | £48.50

ISBN_10 ► 3-540-34645-7

ISBN_13 ► 978-3-540-34645-6



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A. Mielke, Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany (Ed.)

Analysis, Modeling and Simulation of Multiscale Problems

This book reports recent mathematical developments in the DFG Priority Programme "Analysis, Modeling and Simulation of Multiscale Problems", which started as a German research initiative in 2006. The field of multiscale problems occurs in many fields of science, such as microstructures in materials, sharp-interface models, many-particle systems and motions on different spatial and temporal scales in quantum mechanics or in molecular dynamics. Recently developed tools are described in a comprehensive manner. This book provides the state of the art on the mathematical foundations of the modeling and the efficient numerical treatment of such problems.

Field of interest

Computational Mathematics and Numerical Analysis

Target groups

Researchers and graduate students

Type of publication

Proceedings

Nexus Network Journal Vol. 8,1

Editor-in-chief: K. Williams

This book illustrates the use of fundamental principles of geometry and proportion in two ancient cultures, the Bronze Age and the Roman Age, as well as in twentieth-century North America.

Features

► Four articles on the research topic ► One article on the golden section ► Four articles on didactics

Field of interest

Applications of Mathematics

Target groups

Architects, mathematicians and everyone interested in the subject

Type of publication

Contributed volume

Nexus Network Journal Vol. 8,2

Editor-in-chief: K. Williams

This book presents an exploration of the arch from the points of view of architecture, mathematics, engineering, construction history, and cultural symbolism. The arch, one of the most beautiful ways that architects invented to go from "here" to "there," spans greater distances and sustains larger loads than a simple post and beam structure, but because it is also more complex, an Eastern proverb called it "the structure that never sleeps." Leonardo da Vinci described the arch as "two weaknesses which, leaning on each other, become a strength," a metaphor for the way that science and art lean on each other to strengthen our lives.

Features

► Six articles on arches as gateways from science to culture ► Articles on mathematical elements in historic and contemporary architecture as well as on ratios and morphologic rhythms ► Two book reviews

Field of interest

Applications of Mathematics

Target groups

Architects, mathematicians and everyone interested in the subject

Type of publication

Contributed volume

Due September 2006

2006. Approx. 700 p. Hardcover

► € 99,95 | £77.00

ISBN_10 ► 3-540-35656-8

ISBN_13 ► 978-3-540-35656-1



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Birkhäuser 

Available

2006. 144 p. (Nexus Network Journal, Volume 8,1)
Softcover

► € 38,00 | £29.00

ISBN_10 ► 3-7643-7747-X

ISBN_13 ► 978-3-7643-7747-2



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Birkhäuser 

Due November 2006

2006. Approx. 150 p. (Nexus Network Journal,
Volume 8,2) Softcover

► € 38,00 | £29.00

ISBN_10 ► 3-7643-7761-5

ISBN_13 ► 978-3-7643-7761-8



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M. Pettini, Osservat. Astrofisico Arcetri, Firenze, Italy

Geometry and Topology in Hamiltonian Dynamics and Statistical Mechanics

This book covers a new explanation of the origin of Hamiltonian chaos and its quantitative characterization. The author focuses on two main areas: Riemannian formulation of Hamiltonian dynamics, providing an original viewpoint about the relationship between geodesic instability and curvature properties of the mechanical manifolds; and a topological theory of thermodynamic phase transitions, relating topology changes of microscopic configuration space with the generation of singularities of thermodynamic observables. The two areas are strongly related because the geometrization of microscopic dynamics, which is the ultimate physical source of phase transitions, naturally leads to investigate how geometry and topology of the mechanical manifolds have to change to induce a phase transition. Mathematicians and physicists working in this area will find this book of interest.

Features

► The subject of the book is very original and nothing similar has been written hitherto ► Will be of interest to both mathematicians and physicists ► Numerous illustrations throughout

Contents

Background in Physics.- Geometrization of Hamiltonian Dynamics.- Integrability.- geometry and Chaos.- Topological aspects of phase transitions.- Quantum systems.- Appendices: A. Elements of Riemannian geometry B. Kaehler manifolds C. Elementary Morse theory D. de Rham's cohomology theory.

Field of interest

Applications of Mathematics

Target groups

Researchers, graduate students

Type of publication

Monograph

T. Qian, M. I. Vai, University of Macao, China;
X. Yuesheng, University of Syracuse, NY, USA (Eds.)

Wavelet Analysis and Applications

This volume reflects the latest developments in the area of wavelet analysis and its applications. Since the corner-stone lecture of Yves Meyer presented at the ICM 1990 in Kyoto, in some extent, wavelet analysis has often been said to be mainly an applied area. However, a significant percentage of contributors now are prominent mathematicians working mainly in theoretical mathematical areas, and the concept of wavelets continuously stretches across various disciplines of mathematics.

Features

► Based on the conference Wavelet Analysis and Applications 2005 held November 29 -December 2, at the University of Macau ► Contains carefully selected and rigorously reviewed contributions giving a good picture of the state of the art in wavelet analysis and its manifold applications

Contents

Preface.- I. Wavelet Theory.- 1. Approximation and Fourier Analysis - 2. Construction of Wavelets and Frame Theory - 3. Fractal and Multifractal Theory, Wavelet Algorithms, Wavelets in Numerical Analysis - 4. Time-Frequency Analysis, Adaptive Representation of Nonlinear and Non-stationary Signals.- II. Wavelet Applications.

Field of interest

Abstract Harmonic Analysis

Target groups

Postgraduates and researchers in harmonic and wavelet analysis

Type of publication

Proceedings

A. M. Quarteroni, École Polytechnique Fédérale de Lausanne, Switzerland; R. Sacco, Politecnico di Milano, Milan, Italy; F. Saleri, Università di Milano, Milan, Italy

Numerical Mathematics

Numerical mathematics proposes, develops, analyzes and applies methods from scientific computing to several fields including analysis, linear algebra, geometry, approximation theory, functional equations, optimization and differential equations.

This book provides the mathematical foundations of numerical methods and demonstrate their performance on examples, exercises and real-life applications. This is done using the MATLAB software environment, which allows an easy implementation and testing of the algorithms for any specific class of problems.

The book is addressed to students in Engineering, Mathematics, Physics and Computer Sciences. The attention to applications and software development makes it valuable also for users in a wide variety of professional fields.

In this second edition, the readability of pictures, tables and program headings has been improved. Several changes in the chapters on iterative methods and on polynomial approximation have also been added.

Features

► Extremely popular textbook on numerical hyperbolic Initial Boundary Value Problems.- References.- Index of MATLAB Programs.- Index.

Field of interest

Numerical Analysis

Target groups

Graduate students, researchers

Type of publication

Graduate/Advanced undergraduate textbook

Birkhäuser 

Due January 2007

2007. Approx. 331 p. (Interdisciplinary Applied Mathematics, Volume 32) Hardcover

► approx. € 52,95 | £40.50

ISBN_10 ► 0-387-30892-X

ISBN_13 ► 978-0-387-30892-0



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Due November 2006

2006. Approx. 616 p. with CD-ROM (Applied and Numerical Harmonic Analysis) Hardcover

► € 128,00 | £98.50

ISBN_10 ► 3-7643-7777-1

ISBN_13 ► 978-3-7643-7777-9



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Due October 2006

2nd ed. 2007. Approx. 684 p. (Texts in Applied Mathematics, Volume 37) Hardcover

► € 59,95 | £46.00

ISBN_10 ► 3-540-34658-9

ISBN_13 ► 978-3-540-34658-6



9 783540 346586



Y. Sone, University of Kyoto, Japan

Molecular Gas Dynamics

Theory, Techniques, and Applications

This self-contained book is an up-to-date description of the basic theory of molecular gas dynamics and its various applications. The progress in the field over the last thirty years has greatly enhanced the original theory and has stimulated interesting and critical gas dynamic phenomena and problems. 'Molecular Gas Dynamics', unique in the literature, presents working knowledge, theory, techniques, and typical phenomena in rarefied gases for theoretical development and application. Basic theory is developed in a systematic way and presented in a form easily applied for practical use.

Features

► An up-to-date description of the basic theory of molecular gas dynamics and its various applications ► The progress of the field over the last thirty years has greatly enhanced the original theory and has stimulated interesting and critical gas dynamic phenomena and problems ► Presents working knowledge, theory, techniques, and typical phenomena in rarefied gases for theoretical development and application

Contents

Highly Rarefied Gas: Free Molecular Gas and Its Correction.- Slightly Rarefied Gas Flows: Asymptotic Theory of the Boltzmann System for Small Knudsen Numbers.- Simple Flows.- Flows Induced by Temperature Fields.- Flows with Evaporation and Condensation.- Bifurcation in Half-Space Problem of Evaporation and Condensation.- Ghost Effect and Bifurcation I: Bénard and Taylor - Couette Problems.- Ghost Effect and Bifurcation II: Ghost Effect of Infinitesimal Curvature and Bifurcation of the Plane Couette Flow..

Field of interest

Applications of Mathematics

Target groups

Graduate students, applied mathematicians, theoretical physicists / math physicists, engineers

Type of publication

Graduate/Advanced undergraduate textbook

Birkhäuser 

Due September 2006

2006. Approx. 656 p. 179 illus. (Modeling and Simulation in Science, Engineering and Technology) Hardcover

► approx. € 82,00 | £63.00

ISBN_10 ► 0-8176-4345-1

ISBN_13 ► 978-0-8176-4345-4



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Y. Takahara, Chiba Institute of Technology, Chiba, Japan; Y. Liu, Central South University, Changsha Hunan, China

Foundations and Applications of MIS

A Model Theory Approach

Foundations and Applications of MIS presents a unique systems theory approach to management information system (MIS) development. It covers an outline of the approach, providing a theoretical foundation for MIS from the systems theoretic viewpoint before presenting practical applications ranging from a transaction processing system to a solver system. The author also describes his newly developed extended Prolog programming language, which takes full advantage of the mathematical framework employed. High-level mathematics is combined with sophisticated software engineering in this approach to address the practical problem area of designing MISs; it is the synergy of these two areas with underlying systems thinking that gives this book its unique identity.

Features

► Presents a unique systems theoretic approach to MIS development ► Practical examples such as a transaction processing system and a solver system are discussed in detail

From the contents:

Part I. New Paradigm of Systems Development.- New Systems Development Methodology: The Model Theory Approach.- Part II. Model Construction Language and Systems Implementation Language: extProlog.- Computer-Acceptable Set Theory for Model Construction.- Implementation Language: extProlog.- Part III. Model Theory Approach to Solver Systems Development.- Model Theory Approach to Solver Systems Development: Outline.- User Model and Standardized Goal Seeker.

Field of interest

Mathematical Modeling and Industrial Mathematics

Target groups

Senior and graduate students, researchers in MIS, systems engineers, systems scientists

Type of publication

Monograph

Due September 2006

2007. Approx. 400 p. 126 illus. (IFSR International Series on Systems Science and Engineering, Volume 24) Hardcover

► € 99,95 | £77.00

ISBN_10 ► 0-387-31414-8

ISBN_13 ► 978-0-387-31414-3



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G. D. Villa Salvador, CINVESTAV del IPN, Mexico City, Mexico

Topics in the Theory of Algebraic Function Fields

The fields of algebraic functions of one variable appear in several areas of mathematics: complex analysis, algebraic geometry, and number theory. This text adopts the latter perspective by applying an arithmetic-algebraic viewpoint to the study of function fields as part of the algebraic theory of numbers. The examination explains both the similarities and fundamental differences between function fields and number fields, including many exercises and examples to enhance understanding and motivate further study.

The only prerequisites are a basic knowledge of field theory, complex analysis, and some commutative algebra. The book can serve as a text for a graduate course in number theory or an advanced graduate topics course.

Features

► Adopts a number-theoretic perspective by applying an arithmetic-algebraic viewpoint to the study of function fields as part of the algebraic theory of numbers ► Explains both the similarities and fundamental differences between function fields and number fields ► Includes many exercises and examples to enhance understanding and motivate further study

Field of interest

Number Theory

Target groups

Advanced undergraduates, grad students and researchers interested in number theory, field theory, and their interactions

Type of publication

Graduate/Advanced undergraduate textbook

Birkhäuser 

Due September 2006

Based on the original Spanish edition, 'Introducción a la Teoría de las Funciones Algebraicas', Fondo de Cultura Económica, México, 2003

2006. XVI, 652 p. 20 illus. (Mathematics: Theory & Applications) Hardcover

► € 78,00 | £60.00

ISBN_10 ► 0-8176-4480-6

ISBN_13 ► 978-0-8176-4480-2



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D. Weiskopf, Simon Fraser University, Burnaby, BC,
Canada

GPU-Based Interactive Visualization Techniques

Scientific visualization has become an important tool for visual analysis in many scientific, engineering, and medical disciplines.

This book focuses on efficient visualization techniques, which are the prerequisite for the interactive exploration of complex data sets. High performance is primarily achieved by devising algorithms for the fast graphics processing units (GPUs) of modern graphics hardware. Other aspects discussed in the book include parallelization on cluster computers with several GPUs, adaptive rendering methods, multi-resolution models, and non-photorealistic rendering techniques for visualization. Covering both the theoretical foundations and practical implementations of algorithms, this book provides the reader with a basis to understand and reproduce modern GPU-based visualization approaches.

Features

► First book to focus on GPU methods for scientific visualization ► Fast growing field

Field of interest

Visualization

Target groups

Researchers and graduate students in Computer Science, visualization software developers

Type of publication

Monograph

Due September 2006

2006. XV, 312 p. With many colour figures. (Mathematics and Visualization) Hardcover

► € 79,95 | £61.50

ISBN_10 ► 3-540-33262-6

ISBN_13 ► 978-3-540-33262-6



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