BULLETIN BIBLIOGRAPHIQUE

Généralités

Peter J. CAMERON. — **Introduction to algebra.** — Oxford science publications. — Un vol. broché, 15,5×23,5, de X, 295 p. — ISBN 0-19-850194-3. — Prix: £16.95. — Oxford University Press, Oxford, 1998.

The book begins with the theories of rings, groups, and vector spaces. The basic concepts of subring, homomorphism, and ideal (and their analogues for groups and vector spaces) are developed in detail. Students are led to further developments in group and ring theory – simple groups and extensions, Noetherian rings, an outline of universal algebra, lattices and categories – and to applications such as Galois theory and coding theory. There is also a chapter on modules, and one outlining the construction of the number systems from scratch, and proving in three different ways that transcendental numbers exist.

Srishti D. CHATTERJI. — **Cours d'analyse, vol. 3: Equations différentielles ordinaires et aux dérivées partielles.** — Mathématiques. — Un vol. broché, 16×24. de XXV. 755 p. — ISBN 2-88074-350-8. — Prix: SFr. 108.00. — Presses polytechniques et universitaires romandes, Lausanne, 1998.

L'objectif principal du 3ᵉ volume de ce Cours d'Analyse est de donner une introduction à la théorie des équations différentielles ordinaires et aux dérivées partielles et d'introduire certains outils de base pour les méthodes mathématiques de la physique, comme les espaces hilbertiens, les séries et l'intégrale de Fourier-Laplace et les distributions. Outil de travail conçu pour les étudiants en mathématiques et en physique dans leurs deuxième et troisième années d'études, la richesse et la complétude de son index en font un manuel de référence pour tout mathématicien.

Volker DIETRICH, Klaus HABETHA, Gerhard JANK, (Editors). — **Clifford algebras and their application in mathematical physics: Aachen 1996.** — Fundamental theories of physics, vol. 94. — Un vol. relié, 17×24,5, de XXXII, 441 p. — ISBN 0-7923-5037-5. — Prix: Dfl. 360.00. — Kluwer Academic Publishers, Dordrecht. 1998.

Clifford algebras continues to be a fast growing discipline with ever-increasing applications in many scientific fields. This volume contains the lectures given at the *Fourth Conference on Clifford Algebras and their Applications in Mathematical Physics,* held at RWTH Aachen in May 1996. The papers represent an excellent survey of the newest developments around Clifford Analysis and its applications to theoretical physics.

Duden Rechtschreibung der deutschen Sprache, Bd. 1. — 21., völlig neu bearbeitete und erweiterte Auflage. — Un vol. relié, 14×20, de 910 p. — ISBN 3-411-04011-4. — Prix: DM 38.00 (CD-ROM-Version: DM 78.00). — Dudenverlag, Mannheim. 1996.

Nach der Unterzeichnung der zwischenstaatlichen Erklärung zur neuen deutschen Rechtschreibung wird die Neuregelung am 1. August 1998 in Kraft treten. Der neue Duden enthält die neuen Regeln und alle neuen Schreibungen. Das Wörterverzeichnis ist um zahlreiche Neuwörter erweitert. Mit Richtlinien für die Textverarbeitung und Korrekturvorschriften.

A. Gardiner. — **The Mathematical Olympiad handbook: an introduction to problem solving based on the first 32 British Mathematical Olympiads 1965-1996.** — Oxford science publications. — Un vol. broché, 16×23,5, de xii, 229 p. — ISBN 0-19-850105-6. — Prix: £14.95. — Oxford, Oxford University Press, 1997.

Mathematical Olympiad competitions started in Hungary at the end of the nineteenth century; national Olympiads are now held in over a hundred countries, and there are numerous international events. Olympiads challenge able secondary school pupils to develop their mathematical skills by solving problems. The book contains problems from the first 32 British Mathematical Olympiad (BMO) papers 1965-96 and gives hints and outline solutions to each problem from 1975 onwards.

Michiel Hazewinkel, (Editor). — **Encyclopaedia of mathematics, Supplement vol. 1.** — Un vol. relié, 22×31, de viii, 588 p. — ISBN 0-7923-4709-9. — Prix: Dfl. 495.00. — Kluwer Academic Publishers, Dordrecht, 1997.

This is the first supplementary volume to Kluwer's Encyclopaedia of Mathematics. This additional volume contains nearly 600 new entries written by experts and covers developments and topics not included in the already published 10-volume set. These entries have been arranged alphabetically throughout. A detailed index is included in the book. This supplementary volume enhances the existing 10-volume set. Together, these eleven volumes represent the most authoritative, comprehensive up-to-date Encyclopaedia of Mathematics available.

Gérard Klotz. — **Mathématiques pour les sciences économiques et sociales, Algèbre 1: cours et exercices.** — Collection Major. — Un vol. broché, 17,5×24, de xv, 330 p. — ISBN 2-13-048167-1. — Prix: FF 188.00. — Presses universitaires de France, Paris, 1998.

Cet ouvrage couvre la totalité du programme officiel d'algèbre figurant aux concours interne et externe du Certificat d'Aptitude à l'Enseignement du Secondaire de Sciences économiques et sociales. Il s'adresse aussi aux étudiants des premiers cycles et à ceux qui présentent d'autres concours d'un niveau équivalent ou supérieur (CAPET – Agrégation). La démarche adoptée est très progressive. Après une révision des programmes du secondaire, les nouvelles notions à maîtriser sont présentées de façon simple et illustrées par de nombreux exemples. Conçu pour travailler à domicile, ce manuel comprend un cours complet et un grand nombre d'exercices tous intégralement corrigés et rédigés.

John A. Nohel, David H. Sattinger, (Editors). — **Selected papers of Norman Levinson, vol. 1 et 2.** — 2 vol. reliés, 18×26, de xl, 533 p. et de xxii, 550 p. respectivement. — ISBN 0-8176-3862-8 (vol. 1), 0-8176-3979-9 (vol. 2), 0-8176-3978-0 (set). — Prix: SFr. 648.00 (2 vol.). — Birkhäuser, Boston, 1998.

This collection of Norman Levinson's Selected Papers bears witness to the profound impact Levinson had on research in mathematical analysis with applications to problems in science and technology. Levinson's originality is reflected in his fundamental contributions to complex, harmonic and stochastic analysis, to linear and nonlinear differential and integral equations, and to analytic number theory, where he made significant advances toward resolving the Riemann hypothesis up to the end of his life. The two volumes are divided by topic, with commentaries by some of those who have felt the impact of Levinson's legacy: B. Conrey, B. Levitan, J. Moser, J. Nohel, M. Pinsky, A. Radakrishnan, R. Redheffer, D. Sattinger, H. Sussman and E. Zeidler. Personal tributes from H. McKean, W.T. Martin, B. Kostant and Levinson's wife Fagi honor the memory of this remarkable man.

Carmelo MAMMANA, Vinicio VILLANI, (Editors). — **Perspectives on the teaching of geometry for the 21ˢᵗ century: an ICMI study.** — New ICMI study series, vol. 5. — Un vol. relié, 16,5×25, de VIII, 353 p. — ISBN 0-7923-4990-3. — Prix: Dfl. 240.00. — Kluwer Academic Publishers, Dordrecht, 1998.

There is an increasing awareness that geometry plays a key role in mathematics and learning mathematics. Although geometry has been eclipsed in the mathematics curriculum, research in geometry has blossomed as new ideas have arisen from inside mathematics and other disciplines, including computer science. In the present ICMI study, the whole spectrum of teaching and learning of geometry is analyzed. Experts from all over the world took part in this study, which was conducted on the basis of recent international research, case studies, and reports on actual school practice.

Eli MAOR. — **Trigonometric delights.** — Un vol. relié, 16,5×24, de XIV, 236 p. — ISBN 0-691-05754-0. — Prix: US$24.95. — Princeton University Press, Princeton, 1998.

Rejecting the usual arid descriptions of sine, cosine, and their trigonometric relatives, the author brings the subject to life in a compelling blend of history, biography, and mathematics. He begins by examining the "proto-trigonometry" of the Egyptian pyramid builders, he shows how Greek astronomers developed the first true trigonometry. He traces the slow emergence of modern, analytical trigonometry, recounting its colorful origins in Renaissance Europe's quest for more accurate artillery, more precise clocks, and more pleasing musical instruments, etc.

Thérèse MERLIER. — **Exercices corrigés sur les formes quadratiques et groupes classiques.**— Mathématiques. — Un vol. broché, 15,5×22, de 182 p. — ISBN 2-13-045796-7. — Prix: FF. 188.00 — Presses Universitaires de France, Paris, 1998.

Cet ouvrage, composé uniquement d'exercices et de problèmes, tous présentés avec un corrigé assez détaillé, illustre le livre de Cours de R. Deheuvels, *Formes quadratiques et groupes classiques,* paru dans la même collection. Cet ouvrage s'adresse à tous ceux qui veulent approfondir leurs connaissances sur les formes quadratiques dégénérées ou non, les formes pseudo-hermitiennes, les algèbres de Clifford et sur les problèmes de géométrie liés aux isométries des espaces concernés.

Pierre MEUNIER. — **Agrégation interne de mathématiques: problèmes corrigés et commentés.** — Mathématiques. — Un vol. broché, 15,5×22, de 431 p. — ISBN 2-13-049404-8. — Prix: FF. 258.00. — Presses Universitaires de France, Paris, 1998.

Ce recueil de problèmes corrigés et commentés est constitué de dix-sept énoncés, chacun d'eux étant suivi d'une correction détaillée en liaison avec le cours dont les principaux résultats ont été rappelés et classés par thèmes au début de l'ouvrage afin que l'utilisateur de ce manuel puisse progresser assez rapidement. Dans presque tous les problèmes, de nombreux exemples faisant partie intégrante des questions à résoudre ont été volontairement placés dans les énoncés afin que chacun puisse acquérir le minimum de savoir-faire pratique sans lequel toute approche théorique est inutile.

Histoire

Olli LEHTO. — **Mathematics without borders: a history of the International Mathematical Union.** — Un vol. relié, 16×24, de XVI, 399 p. — ISBN 0-387-98358-9. — Prix: DM 68.00. — Springer, New York, 1998.

The history of international mathematical cooperation over the last hundred years – from the first international congress in 1897 to plans for the World Mathematical Year 2000 – as told by

Prof. Olli Lehto, is a surprisingly compelling story, for reflected in the history of the International Mathematical Union (IMU) is all the strife among world powers, as well as aspirations for cooperation among nations in an increasingly interdependent world. But what keeps you turning pages is the very human story of individuals, among them many of the great mathematicians of our century, united in the common purpose of advancing their science, told against the backdrop of world events.

Vladimir MAZ'YA, Tatyana SHAPOSHNIKOVA. — **Jacques Hadamard, a universal mathematician.** — History of mathematics, vol. 14. — Un vol. relié, 19×26, de XXV, 574 p. — ISBN 0-8218-0841-9. — Prix: £52.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1998.

This book presents the story of the long life and great accomplishments of Jacques Hadamard (1865-1963), who was once called "the living legend of mathematics". Hadamard's contributions to mathematics are landmarks in various fields. His life is linked with world history of the 20th century in a dramatic way. This work provides an inspiring view of the development of various branches of mathematics during the 19th and 20th centuries. Hadamard's life is described in a readable and inviting way and the book contains over 300 photographs and illustrations.

Michael MONASTYRSKY. — **Modern mathematics in the light of the Fields medals.** — Un vol. broché, 12×19,5, de XV, 160 p. — ISBN 1-56881-083-0. — Prix: US$19.95. — A.K. Peters, Wellesley, Mass., 1998.

This short book examines the evolution of certain areas of modern mathematics by recounting the past winners of the international Fields medal, the "Nobel prize" of mathematics. Subjects like topology, complex analysis, number theory, and mathematical logic are brought to life through the personalities of those who fundamentally contributed to their development. It makes a charming addition to any mathematician's bookshelf.

V.S. VARADARAJAN. — **Algebra in ancient and modern times.** — Mathematical world, vol. 12. — Un vol. broché, 18×25,5, de XII, 142 p. — ISBN 0-8218-0989-X. — Prix: US$25.00. — American Mathematical Society, Providence R.I., and Hindustan Book Agency, New Delhi, 1998, distributed world-wide except in India, Sri Lanka, Bangladesh, Pakistan and Nepal by the American Mathematical Society, Providence R.I.

This text offers a special account of Indian work in diophantine equations during the 6th through 12th centuries and Italian work on solutions of cubic and biquadratic equations from the 11th through 16th centuries. The volume traces the historical development of algebra and the theory of equations from ancient times to the beginning of modern algebra, outlining some modern themes, such as the fundamental theorem of algebra, Clifford algebras, and quarternions. It is geared toward undergraduates who have no background in calculus.

Logique et fondements

Samuel R. BUS, (Editor). — **Handbook of proof theory.** — Studies in logic and the foundations of mathematics, vol. 137. — Un vol. relié, 16×23, de 811 p. — ISBN 0-444-89840-9. — Prix: Dfl. 280.00. — Elsevier, Amsterdam, 1998.

Samuel R. Buss: An introduction to proof theory. — Samuel R. Buss: First-order proof theory of arithmetic. — Matt Fairtlough and Stanley S. Wainer: Hierarchies of provably recursive functions. — Wolfram Pohlers: Subsystems of set theory and second order number

theory. — Jeremy Avigad and Solomon Feferman: Gödel's functional ("Dialectica") interpretation. — Anne S. Troelstra: Realizability. — Giorgi Japaridze and Dick de Jongh: The logic of provability. — Pavel Pudlák: The lengths of proofs. — Gerhard Jäger and Robert F. Stärk: A proof-theoretic framework for logic programming. — Robert L. Constable: Types in logic, mathematics and programming.

Théorie des ensembles

Carlos Augusto Di Prisco, Jean A. Larson, Jean Bagaria and A.R.D. Mathias, (Editors) — **Set theory: techniques and applications.** — Curaçao 1995 and Barcelona 1996 conferences. — Un vol. relié, 16,5×25, de x, 226 p. — ISBN 0-7923-4905-9. — Prix: Dfl. 175.00. — Kluwer Academic Publishers, Dordrecht, 1998.

During the past 25 years, set theory has developed in several interesting directions. The most outstanding results regard the application of sophisticated techniques to problems in analysis, topology, infinitary combinatorics and other areas of mathematics. This book contains a selection of contributions, some of which are expository in nature, embracing various aspects of the latest developments. Among topics treated are forcing axioms and their applications, combinatorial principles used to construct models, and a variety of other set theoretical tools including inner models, partitions and trees.

S.M. Srivastava. — **A course on Borel sets.** — Graduate texts in mathematics, vol. 180. — Un vol. relié, 16×24, de xvi, 261 p. — ISBN 0-387-98412-7. — Prix: DM 98.00. — Springer, New York, 1998.

This course provides a thorough introduction to Borel sets and measurable selections, and acts as a stepping stone to descriptive set theory by presenting important techniques such as universal sets, prewellordering, and scales. It is written in an easily understandable style and employs only naive set theory, general topology, analysis and algebra. A large number of interesting exercises are given throughout the text.

Analyse combinatoire

Armen S. Asratian, Tristan M.J. Denley and Roland Häggkvist. — **Bipartite graphs and their applications.** — Cambridge tracts in mathematics, 131. — Un vol. relié, 15,5×23,5, de xi, 259 p. — ISBN 0-521-59345-X. — Prix: £40.00. — Cambridge University Press, Cambridge, 1998.

Bipartite graphs are perhaps the most basic of objects in graph theory. However, until now they have been considered only as a special class in some wider context. This is the first book which deals solely with bipartite graphs. Essentially all proofs are given in full and numerous exercises of all standards have also been included. The theory is ilustrated with many applications especially to problems in timetabling, chemistry. communication networks and computer science.

Béla Bollobás. — **Modern graph theory.** — Graduate texts in mathematics, vol. 184. — Un vol. broché, 16,5×23,5, de xiii, 394 p. — ISBN 0-387-98488-7. — Prix: DM 68.00. — Springer, New York, 1998.

This book is an in-depth account of graph theory. It reflects the current state of the subject and emphasizes connections with other branches of pure mathematics. The volume grew out of the author's earlier book *Graph theory: an introductory course,* but its length is well over twice

that of its predecessor, allowing it to reveal many exciting new developments in the subject such as Szemerédi's regularity lemma and its use, Shelah's extension of the Hales-Jewett theorem, the precise nature of the phase transition in a random graph process, the connection between electrical networks and random walks on graphs, and the Tutte polynomial and its cousins in knot theory. The book contains an unusually large number of exercises: over 600 in total.

Fan CHUNG, Ron GRAHAM. — **Erdős on graphs: his legacy of unsolved problems.** — Un vol. relié, 19,5×24,5, de XIII, 142 p. — ISBN 1-56881-079-2. — Prix: US$ 30.00. — A.K. Peters, Wellesley, Mass., 1998.

This book is a tribute to Paul Erdős, the wandering mathematician once described as "the prince of problem solvers and the absolute monarch of problem posers". It examines – within the context of his unique personality and lifestyle – the legacy of open problems he left to the world of mathematics after his death in 1996. By cataloguing the unsolved problems of Erdős in a comprehensive and well-documented volume, the authors hope to continue the work of an unusual and special man who fundamentally influenced the field of mathematics.

Dietmar CIESLIK. — **Steiner minimal trees.** — Nonconvex optimization and its applications, vol. 23. — Un vol. relié, 17×24,5, de XI, 319 p. — ISBN 0-7923-4983-0. — Prix: Dfl. 260.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book is the result of 18 years of research into Steiner's problem and its relatives in theory and applications. The purpose of the book is to sum up and generalize many of these results for arbitrary finite-dimensional Banach spaces. It shows that we can create a homogeneous and general theory when we consider two dimensions of such spaces, and that we can find many facts which are helpful in attacking Steiner's problem in the higher-dimensional cases. The author examines the underlying mathematical properties of this network design problem and demonstrates how it can be attacked by various methods of geometry, graph theory, calculus, optimization and theoretical computer science.

Ulrich HUCKENBECK. — **Extremal paths in graphs: foundations, search strategies, and related topics.** — Mathematical topics, vol. 10. — Un vol. relié, 18×24,5, de 480 p. — ISBN 3-05-501658-0. — Prix: DM 168.00. — Akademie Verlag, Berlin, distributed by Wiley-VCH, Weinheim, 1997.

The central problem of this book is the search for optimal paths in graphs. The most well-known case is a network of rails or roads; the problem is to find a shortest route in this network. The book describes generalized versions of Dijkstra's algorithm, of the Ford-Bellman algorithm, and of other algorithms; these generalized search strategies find paths of minimum or almost minimum costs even if the cost function is not additive. Many modifications of optimal path problems are discussed, for example the Traveling Salesman Problem, which is *NP*-complete. Also, the book is about structural properties of cost measures for paths in graphs. Moreover, the book contains many combinatorial results about very long or very short paths in graphs.

Jiří MATOUŠEK, Jaroslav NEŠETŘIL. — **Invitation to discrete mathematics.** — Un vol. broché, 15,5×23,5, de XV, 410 p. — ISBN 0-19-850207-9. — Prix: £19.50. — Clarendon Press, Oxford, 1998.

This book is a clear, accessible, and self-contained introduction to discrete mathematics, and in particular to combinatorics and graph theory. The reader is led to an understanding of the basic principles and methods of actually doing mathematics. This book is·more narrowly focused than many discrete mathematics textbooks: it treats selected topics in unusual depth and from several points of view. More than 400 exercises, ranging widely in difficulty and many accompanied by hints for solution, support this approach.

O. MELNIKOV, V. SARVANOV, R. TYSHKEVICH, V. YEMELICHEV and I. ZVEROVICH, (Editors). — **Exercises in graph theory.** — Kluwer texts in the mathematical sciences, vol. 19. — Un vol. relié, 17×25, de VIII, 354 p. — ISBN 0-7923-4906-7. — Prix: Dfl. 265.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume covers the principal branches of graph theory in more than a thousand exercises of varying complexity. Each section starts with the main definitions and a brief theoretical discussion, which will serve as a reminder when solving the problems. Answers and hints are supplied separately. Topics include trees, independence and coverings, matching, tours, planarity, colourings, degree sequences, connectivity, digraphs and hypergraphs.

W.T. TUTTE. — **Graph theory as I have known it.** — Oxford lecture series in mathematics and its applications, vol. 11. — Oxford science publications. — Un vol. relié, 16×24, de 156 p. — ISBN 0-19-850251-6. — Prix: £27.50. — Clarendon Press, Oxford, 1998.

The book provides a unique and unusual introduction to graph theory by one of the founding fathers of the subject. The opening chapter tells of the first problems worked on by the author and his colleagues. Their interest in graph theory was aroused by a problem in a mathematical puzzle book. Beginning with an account of their work on the construction of perfect squares and rectangles, the subsequent chapters describe the development of the author's ideas: the disproof of Tait's conjecture on Hamiltonian circuits, "factorizing" graphs, algebra in graph theory, symmetry in graphs, graphs on spheres, and chromatic eigenvalues.

Théorie des nombres

G.E. BERGUM, A.N. PHILIPPOU, A.F. HORADAM, (Editors). — **Applications of Fibonacci numbers, vol. 7.** — Proceedings of the Seventh International Research Conference on Fibonacci Numbers and their Applications, Technische Universität, Graz, Austria, July 15-19, 1996. — Un vol. relié, 17×25, de XXXVI, 484 p. — ISBN 0-7923-5022-7. — Prix: Dfl. 395.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume includes a carefully refereed collection of papers dealing with number patterns, linear recurrences and the application of the Fibonacci numbers to probability, statistics, differential equations, cryptography, computer science and elementary number theory. This volume provides a platform for recent discoveries and encourages further research. It is a continuation of the work presented in the previously published proceedings of the earlier conferences, and shows the growing interest in, and importance of, the pure and applied aspects of Fibonacci numbers in many different areas of science.

Bruce C. BERNDT, Ronald J. EVANS, Kenneth S. WILLIAMS. — **Gauss and Jacobi sums.** — Canadian Mathematical Society series of monographs and advanced texts, vol. 21. — A Wiley interscience publication. — Un vol. relié, 16×24,5, de XI, 583 p. — ISBN 0-471-12807-4. — Prix: £45.50. — John Wiley & Sons, New York, 1998.

The theme, Gauss and Jacobi sums, could be approached in a variety of ways. In this book the focus is on examining basic properties of Gauss and Jacobi sums, providing systematic and explicit evaluations of these sums, and providing applications. This book develops the explicit evaluation of Gauss and Jacobi sums, and the application of these evaluations to the determination of other character sums, such as Jacobsthal, Eisenstein and Brewer sums, the determination of the number of solutions of congruences and residual difference sets, reciprocity laws. The main prerequisites for the book are knowledge of undergraduate modern algebra (including finite fields) and basic material in elementary and algebraic number theory.

Richard A. DUNLAP. — **The golden ratio and Fibonacci numbers.** — Un vol. relié, 16×22,5, de VII, 162 p. — ISBN 981-02-3264-0. — Prix: £23.00. — World Scientific, Singapore, 1997.

From the preface: The golden ratio and Fibonacci numbers have numerous applications [...]. Although much has been written about these numbers, the present book will hopefully fill the gap between those sources which take a philosophical or even mystical approach and the formal mathematical texts. I have tried to stress not only fundamental properties of these numbers but their application to diverse fields of mathematics, computer science, physics and biology. I believe that this is the first book to take this approach since the application of models involving the golden ratio to the description of incommensurate structures and quasicrystals in the 1970's and 1980's.

Kálmán GYŐRY, Attila PETHŐ, Vera T. SÓS, (Editors). — **Number theory: diophantine, computational and algebraic aspects.** — Proceedings of the International Conference held in Eger, Hungary, July 29-August 2, 1996. — Un vol. relié, 18×24,5, de XVII, 595 p. — ISBN 3-11-015364-5. — Prix: DM 348.00. — Walter de Gruyter, Berlin, 1998.

These proceedings contain 41 selected and refereed research and survey articles based on lectures delivered at the 1996 International Conference on Number Theory held in Eger, Hungary. A significant part of contributions involve various aspects of Diophantine equations ranging from general effective finiteness theorems to efficient algorithms and numerical results: Other topics covered are Diophantine approximations, transcendence theory and in particular Baker's method concerning linear forms in logarithms, the arithmetic theory of elliptic and algebraic curves, the arithmetic of polynomials and algebraic number fields, the geometry of numbers, linear recurrences and digital expansions.

Glyn HARMAN. — **Metric number theory.** — London Mathematical Society monographs, New series, vol. 18. — Oxford science publications. — Un vol. relié, 16×24, de XVIII, 297 p. — ISBN 0-19-850083-1. — Prix: £75.00. — Clarendon Press, Oxford, 1998.

This book deals with the number-theoretic properties of almost all real numbers. It brings together many different types of result never covered within the same volume before, thus showing interactions and common ideas between different branches of the subject. It provides an indispensable compendium of basic results, important theorems and open problems. *Contents:* Introduction. — Normal numbers. — Diophantine approximation. — GCD sums with applications. — Schmidt's method. — Uniform distribution. — Diophantine approximation with restricted numerator and denominator. — Non-integer sequences. — The integer parts of sequences. — Diophantine approximation on manifolds. — Hausdorff dimension of exceptional sets.

Norbert KLINGEN. — **Arithmetical similarities: prime decomposition and finite group theory.** — Oxford mathematical monographs. — Oxford science publications. — Un vol. relié, 16×24, de IX, 275 p. — ISBN 0-19-853598-8. — Prix: £55.00. — Oxford University Press, Oxford, 1998.

This book deals with fundamental number-theoretic questions and their interplay with finite group theory. It reports on the great progress achieved since 1970 through the joint effort of researchers in both areas. The book allows access to the results achieved so far and aims to increase the scientific exchange between number theory and group theory. *Contents:* Introduction. — Prime decomposition. — Kronecker equivalence. — Arithmetical equivalence. — Arithmetical homomorphisms. — Kroneckarian fields. — Variations.

Eli MAOR. — *e*: **the story of a number.** — Un vol. broché, 15,5×23,5, de XIV, 227 p. — ISBN 0-691-05854-7. — Prix: US$ 14.95. — Princeton University Press, Princeton, 1998.

The interest earned on a bank account, the arrangement of seeds in a sunflower, and the shape of the Gateway Arch in St. Louis are all intimately connected with the mysterious number *e*. In this informal and engaging history, Eli Maor portrays the curious characters and the elegant mathematics that lie behind the number. Designed for a reader with only a modest background in mathematics, this biography of *e* brings out that number's central importance in mathematics and illuminates a golden era in the age of science.

Richard A. MOLLIN. — **Fundamental number theory with applications.** — Discrete mathematics and its applications. — Un vol. relié, 16×24, de XII, 439 p. — ISBN 0-8493-3987-1. — Prix: DM 135.00. — CRC Press, Boca Raton, Florida, distributed by Springer-Verlag, Berlin, 1998.

This title combines elementary number theory with algebraic number theory and applications such as those found in cryptology. Beginning with arithmetic of the rational integers and proceeding to an introduction of algebraic number theory via quadratic orders, this text reveals intriguing new applications of number theory. The text provides all of the material essential for an introduction to the fundamentals of number theory: presentation of applications to computer science and algebraic number theory via quadratics, applications to cryptography, solutions to odd-numbered problems, new factoring and primality listing algorithms.

Corps et polynômes

V.V. ISHKHANOV, B.B. LUR'E, D.K. FADDEEV. — **The embedding problem in Galois theory.** — Translations of mathematical monographs, vol. 165. — Un vol. relié, 18,5×26, de XI, 182 p. — ISBN 0-8218-4592-6. — Prix: £65.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1998.

Embedding theory was a common topic of Faddeev's lecture courses at St. Petersburg University. This book is based on these lectures and contains the main results on the embedding problem, which belong for the most part to the schools of Faddeev and Shafarevich. Chapter 1: Preliminary information about the embedding problem. — Chapter 2: The compatibility condition. — Chapter 3: The embedding problem with Abelian kernel. — Chapter 4: The embedding problem for local fields. — Chapter 5: The embedding problem with non-Abelian kernel for algebraic number fields.

Géométrie algébrique

Robert BIX. — **Conics and cubics: a concrete introduction to algebraic curves.** — Undergraduate texts in mathematics. — Un vol. relié, 16×24, de X, 289 p. — ISBN 0-387-98401-1. — Prix: SFr. 89.50. — Springer, New York, 1998.

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 Bézout's theorem on the number of intersections of two curves.

David Cox, John Little, Donal O'Shea. — **Using algebraic geometry**. — Graduate texts in mathematics, vol. 185. — Un vol. broché, 15,5×23,5, de XII, 499 p. — ISBN 0-387-98492-5. — Prix: DM 78.00. — Springer, New York, 1998.

In recent years, the discovery of new algorithms for dealing with polynomial equations, coupled with their implementation on fast inexpensive computers, has sparked a minor revolution in the study and practice of algebraic geometry. These algorithmic methods have also given rise to some new applications of algebraic geometry. This book illustrates the many uses of algebraic geometry, highlighting some of the more recent applications of Gröbner bases and resultants. In order to do this, the authors provide an introduction to some algebraic objects and techniques which are more advanced than one typically encounters in a first course, but nonetheless of great utility. The book assumes knowledge of the material covered in a standard undergraduate course in abstract algebra, and it would help to have some previous exposure to Gröbner bases. The book does not assume the reader is familiar with more advanced concepts such as modules.

Joe Harris, Ian Morrison. — **Moduli of curves**. — Graduate texts in mathematics, vol. 187. — Un vol. broché, 16,5×23,5, de XIII, 366 p. — ISBN 0-387-98429-1. — Prix: DM 74.00. — Springer, New York, 1998.

This book provides a guide to a rich subject: algebraic curves and how they vary in families. The aim has been to provide a broad but compact overview of the field which will be accessible to readers with a modest background in algebraic geometry. After the exposition of the foundations, the book goes on to show how moduli spaces of curves are constructed, to illustrate typical applications with the proofs of the Brill-Noether and Gieseker-Petri theorems via limit linear series, and to survey the most important results about their geometry on topics ranging from irreducibility and complete subvarieties to ample divisors and Kodaira dimension.

János Kollár, Shigefumi Mori, with the collaboration of C.H. Clemens, A. Corti. — **Birational geometry of algebraic varieties**. — Cambridge tracts in mathematics, vol. 134. — Un vol. relié, 16×23,5, de VIII, 254 p. — ISBN 0-521-63277-3. — Prix: £30.00. — Cambridge University Press, Cambridge, 1998.

One of the major discoveries of the last two decades in algebraic geometry is the realization that the theory of minimal models of surfaces can be generalized to higher dimensional varieties. This generalization, called the minimal model program or Mori's program, has developed into a powerful tool with applications to diverse questions in algebraic geometry and beyond. The book provides the first comprehensive introduction to the circle of ideas developed around the program, the prerequisites being only a basic knowledge of algebraic geometry.

Peter E. Newstead, (Editor). — **Algebraic geometry**. — Papers presented for the EURO-PROJ conferences in Catania and Barcelona. — Lecture notes in pure and applied mathematics, vol. 200. — Un vol. broché, 18×25,5, de VIII, 405 p. — ISBN 0-8247-0234-4. — Prix: US$165.00. — Marcel Dekker, Inc., New York, 1998.

In this compendium of original, refereed papers, leading international mathematicians communicate state-of-the-art research in algebraic geometry that emphasizes classification problems, in particular, studies on the structure of moduli spaces of vector bundles and the classification of curves and surfaces. The book furnishes topics such as: Brill-Noether theory, stability of multiplicities of plethysm, ruled surfaces and their blowups, Fourier-Mukai transform of coherent sheaves, Prym theta functions, Burchnall-Chaundy theory and vector bundles, equivalence of m-Hilbert stability and slope stability, etc.

Lou VAN DEN DRIES. — **Tame topology and o-minimal structures.** — London Mathematical Society lecture note series, vol. 248. — Un vol. broché, 15,5×23, de x, 180 p. — ISBN 0-521-59838-9. — Prix : £24.95. — Cambridge University Press, Cambridge, 1998.

These notes give a self-contained treatment of the theory of o-minimal structures from a geometric and topological viewpoint, assuming only rudimentary algebra and analysis. The book starts with an introduction and overview of the subject. Later chapters cover the monotonicity theorem, cell decomposition, and the Euler characteristics in the o-minimal setting and show how these notions are easier to handle than in ordinary topology. The remarkable combinatorial property of o-minimal structures, the Vapnik-Chervonenkis property, is also covered.

Algèbre linéaire et multilinéaire, théorie des matrices

Jin Ho KWAK, Sungpyo HONG. — **Linear algebra.** — Un vol. relié, 17,5×25, de IX, 369 p. — ISBN 0-8176-3999-3. — Prix : SFr. 48.00. — Birkhäuser, Boston, 1997.

Linear algebra continues to be one of the most useful courses in undergraduate mathematics, science and engineering, and one of the essential tools for industrial scientists. The primary aim of this book is to give a clear and rigorous presentation of the basic concepts of linear algebra as a coherent part of mathematics. At the same time, by emphasizing computational skills along with mathematical abstractions, the authors illustrate linear algebra's power and usefulness in its applications to such other disciplines as physics, computer science, and economics. The book contains many important examples, explanations and problems right in the middle of the text.

Anneaux et algèbres

Paul E. BLAND. — **Topics in torsion theory.** — Mathematical research, vol. 103. — Un vol. broché, 17×24, de 160 p. — ISBN 3-527-40131-8. — Prix : DM 128.00. — Wiley-VCH, Berlin, 1998.

The purpose of this book is to provide the reader with a quick introduction to torsion theory and to study selected properties of rings and modules in this setting. The material presented ranges from a torsion theoretical treatment of standard topics in ring and module theory to how previously untreated properties of rings and modules might be dealt with in this setting. The approach has been to develop the material so that classical results can be recovered by selecting an appropriate torsion theory. Torsion free covers are also studied and results are given which generalize well-known results on torsion free covers for modules (with usual torsion) over an integral domain.

Winfried BRUNS and Jürgen HERZOG. — **Cohen-Macaulay rings.** — Revised edition. — Cambridge studies in advanced mathematics, 39. — Un vol. broché, 15×23, de XIV, 453 p. — ISBN 0-521-56674-6. — Prix : £24.95. — Cambridge University Press, Cambridge, 1998.

This book meets the need for a thorough, self-contained introduction to the homological and combinatorial aspects of the theory of Cohen-Macaulay rings, Gorenstein rings, local cohomology, and canonical modules. A separate chapter is devoted to Hilbert functions (including Macaulay's theorem) and numerical invariants derived from them. Throughout each chapter the authors have supplied many examples and exercises, which combined with the expository style, will make the book very useful for graduate courses in algebra. As the only modern, broad account of the subject, it will be essential reading for specialists as well.

Stefaan CAENEPEEL. — **Brauer groups, Hopf algebras and Galois theory.** — *K*-monographs in mathematics, vol. 4. — Un vol. relié, 17×24,5, de XVI, 488 p. — ISBN 0-7923-4829-X. — Prix: Dfl. 345.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume is devoted to the Brauer group of a commutative ring and related invariants. Part I presents a new self-contained exposition of the Brauer group of a commutative ring. Included is a systematic development of the theory of Grothendieck topologies and étale cohomology, and discussion of topics such as Gabber's theorem and the theory of Taylor's big Brauer group of algebras without a unit. Part II presents a systematic development of the Galois theory of Hopf algebras with special emphasis on the group of Galois objects of a cocommutative Hopf algebra. The Brauer-Long group of a Hopf algebra over a commutative ring is discussed in Part III.

Grigore CALUGAREANU, Peter HAMBURG. — **Exercises in basic ring theory.** — Kluwer texts in the mathematical sciences, vol. 20. — Un vol. relié, 16,5×25, de XIV, 198 p. — ISBN 0-7923-4918-0. — Prix: Dfl. 160.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book contains almost 350 exercises in the basics of ring theory. The problems form the "folklore" of ring theory, and the solutions are given in as much detail as possible. This makes the work ideally suited for self-study. Subjects treated include zero divisors, ring homomorphisms, divisibility in integral domains, division rings, automorphisms, the tensor product, artinian and noetherian rings, socle and radical rings, semisimple rings, polynomial rings, rings of quotients, and rings of continuous functions.

A.W. CHATTERS, C.R. HAJARNAVIS. — **An introductory course in commutative algebra.** — Oxford science publications. — Un vol. relié, 16,5×24, de VII, 144 p. — ISBN 0-19-853423-X. — Prix: £30.00. — Clarendon Press, Oxford, 1998.

This book is a concise and carefully written introduction to topics in commutative algebra, with an emphasis on worked examples and applications. The elegant algebraic theory is combined with applications to number theory, problems in classical Greek geometry, and the theory of finite fields, which has important uses in other branches of science. Topics covered include an introduction to rings and Euclidean rings, UFDs and PIDs, factorization of polynomials, fields and field extensions, and algebraic numbers.

Vesselin S. DRENSKY, Antonio GIAMBRUNO, Sudarshan SEHGAL, (Editors). — **Methods in ring theory: proceedings of the Trento conference.** — Lecture notes in pure and applied mathematics, vol. 198. — Un vol. broché, 18×25,5, de VIII, 314 p. — ISBN 0-8247-0183-6. — Prix: US$150.00. — Marcel Dekker, Inc., New York, 1998.

Extensive in its coverage of the subject, this book examines broad themes from ring theory and its relation with other branches of algebra, including actions of groups and Hopf algebras, modular group algebras, combinatorics of Young diagrams, growth of algebras, groups of units of group rings, structure theory of group algebras, representation theory of groups and algebras, invariant theory, commutative algebra, theory of superalgebras, varieties of Lie algebras, Kac-Moody algebras, structure of varieties in characteristic *p*... and more.

Catégories, algèbre homologique, cohomologie des groupes

John L. BELL. — **A primer of infinitesimal analysis.** — Un vol. relié, 15,5×23,5, de XIII, 122 p. — ISBN 0-521-62401-0. — Prix: £19.95. — Cambridge University Press, Cambridge, 1998.

In this book basic calculus together with some of its applications to simple physical problems, are presented through the use of a straightforward, rigorous axiomatically formulated

concept of zero square, or nilpotent infinitesimal – that is, a quantity so small that its square and all higher powers can be set, literally to zero. As we show, the systematic employment of these infinitesimals reduces the differential calculus to simple algebra and at the same time, restores to use the infinitesimal methods figuring in traditional applications of the calculus to physical problems.

Théorie des groupes et généralisation

Robert CURTIS, Robert WILSON, (Editors). — **The Atlas of finite groups: ten years on.** — London Mathematical Society lecture note series, vol. 249. — Un vol. broché, 15,5×23, de XIII, 293 p. — ISBN 0-521-57587-7. — Prix: £27.95. — Cambridge University Press, Cambridge, 1998.

This book is a proceedings of a conference organised to mark the tenth anniversary of the publication of the *Atlas*, and contains twenty articles by leading experts in the field, covering many aspects of group theory and its applications. There are surveys on recent developments, expository articles, and research papers, as well as a historical article on the development of the *Atlas* project since 1970. The book emphasises recent advances in group theory and applications which have been stimulated by the comprehensive collection of information contained in the *Atlas*, and covers both theoretical and computational aspects of finite groups, modular representation theory, presentations, and applications to the study of surfaces.

Bertram HUPPERT. — **Character theory of finite groups.** — De Gruyter expositions in mathematics, vol. 25. — Un vol. relié, 17,5×24,5, de VI, 618 p. — ISBN 3-11-015421-8. — Prix: DM 328.00. — Walter de Gruyter, Berlin, 1998.

Based on the classical results by Frobenius, Burnside, and Schur character theory makes a central contribution to the complete classification of finite simple groups. This book serves as a modern introduction to this important part of group theory. In the first sections it develops the theory from the very beginning. Clifford theory is presented in great detail. Other topics covered are Frobenius groups, length of conjugacy classes and character degrees and derived length, groups with a small number of character degrees, etc. A special feature of the book is the inclusion of many examples, mostly of solvable groups, whose character tables in character degrees are determined.

Peter H. KROPHOLLER, Graham A. NIBLO and Ralph STÖHR, (Editors). — **Geometry and cohomology in group theory.** — London Mathematical Society lecture note series, vol. 252. — Un vol. broché, 15,5×23, de XII, 316 p. — ISBN 0-521-63556-X. — Prix: £24.95. — Cambridge University Press, Cambridge, 1998.

This volume reflects the fruitful connections between group theory and topology. It contains articles on cohomology, representation theory, and geometric and combinatorial group theory. Some of the world's best-known figures in this very active area of mathematics have made contributions, including substantial articles from Ol'shanskii, Mikhajlovskii, Carlson, Benson, Linnell, Wilson and Grigorchuk which will be valuable reference works for some years to come.

Gabriel NAVARRO. — **Characters and blocks of finite groups.** — London Mathematical Society lecture note series, vol. 250. — Un vol. broché, 15,5×23, de X, 287 p. — ISBN 0-521-59513-4. — Prix: £24.95. — Cambridge University Press, Cambridge, 1998.

This is an accessible and up to date exposition of modular representation theory of finite groups from a character theoretic viewpoint. The early chapters introduce Brauer characters and blocks and develop their basic properties. The next three chapters study and prove Brauer's first, second and third main theorems in turn. These results are then applied to prove a major

application of finite groups, the Glauberman Z^*-theorem. Later chapters examine Brauer characters in more detail. The relationship between blocks and normal subgroups is also explored and the modular characters and blocks in p-solvable group are discussed. Finally, the character theory of groups with a Sylow p-subgroup of order p is studied. Each chapter concludes with a set of problems.

Groupes topologiques; groupes et algèbres de Lie

Roger W. CARTER and Meinolf GECK, (Editors). — **Representations of reductive groups.** — Publications of the Newton Institute. — Un vol. relié, 15,5×23, de VIII, 191 p. — ISBN 0-521-64325-2. — Prix: £35.00. — Cambridge University Press, Cambridge, 1998.

The articles in this volume provide introductions to various aspects of the representation theory of reductive algebraic groups and related finite reductive groups, including algebraic groups and Lie algebras, reflection groups, abelian and derived categories, the Deligne-Lusztig representation theory of finite reductive groups, Harish-Chandra theory and its generalizations, quantum groups, subgroup structure of algebraic groups, intersection cohomology, and Lusztig's conjectured character formula for irreducible representations in prime characteristic.

Roe GOODMAN, Nolan R. WALLACH. — **Representations and invariants of the classical groups.** — Encyclopedia of mathematics and its applications, vol. 68. — Un vol. relié, 16×24, de XVI, 685 p. — ISBN 0-521-58273-3. — Prix: £65.00. — Cambridge, Cambridge University Press, 1998.

An updated version of invariant theory together with many of the important recent developments are presented in this book. As a text for those new to the area, this book provides an introduction to the structure and finite-dimensional representation theory of the complex classical groups that requires only an abstract algebra course as a prerequisite. For the more advanced reader, the book presents an introduction to the structure and representations of complex reductive algebraic groups and their compact real forms. It also serves as a reference for the main results concerning tensor and polynomial invariants and the finite dimensional representation theory of the classical groups.

Joachim HILGERT, Jimmie D. LAWSON, Karl-Hermann NEEB, Ernest B. VINBERG, (Editors). — **Positivity in Lie theory: open problems.** — De Gruyter expositions in mathematics, vol. 26. — Un vol. relié, 18×24,5, de XII, 290 p. — ISBN 3-11-016112-5. — Prix: DM 258.00. — Walter de Gruyter, Berlin, 1998.

This book consists of 15 articles, each of which is an introduction to a set of open research problems in Lie theory. The unifying theme is "positivity", which means orderings on the level of manifolds, semigroups on the level of groups, and cones on the level of linear spaces and Lie algebras. The topics range from geometric and algebraic structure theory through harmonic analysis, representation theory as far as control theory and probability. The editors of this book have tried to put together a collection of problems with commentary that would serve as an invitation and a guide to the field.

B.P. KOMRAKOV, I.S. KRASIL'SHCHIK, G.L. LITVINOV and A.B. SOSSINSKY, (Editors). — **Lie groups and Lie algebras: their representations, generalisations and applications.** — Mathematics and its applications, vol. 433. — Un vol. relié, 16×25, de VIII, 442 p. — ISBN 0-7923-4916-4. — Prix: Dfl. 340.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The present work reflects the interests of scientists associated with the International Sophus Lie Center, and provides up-to-date results in Lie groups and Lie algebras, quantum

mathematics, hypergroups, homogeneous spaces, Lie superalgebras, the theory of representations and applications to differential equations and integrable systems. Among the topics that are treated are quantization of Poisson structures, applications of multivalued groups, noncommutative aspects of hypergroups, homology invariants of homogeneous spaces, generalisations of the Godbillon-Vey invariant, relations between classical problems of linear analysis and representation theory and the geometry of current groups.

Fonctions de variables réelles

G.V. MILOVANOVIC, (Editor). — **Recent progress in inequalities.** — Mathematics and its applications, vol. 430. — Un vol. relié, 16×25, de XII, 519 p. — ISBN 0-7923-4845-1. — Prix: Dfl. 395.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume provides an extensive survey of the most current topics in almost all subjects in the field of inequalities, written by 85 scientists from twenty countries. Some of the papers were presented at the International Memorial Conference dedicated to Professor D.S. Mitrinovič, which was held at the University of Niš, June 20-22, 1996. Inequalities are to be found everywhere and play an important and significant role in almost all subjects of mathematics.

Mesure et intégration

Wolfgang TOMÉ. — **Path integrals on group manifolds: the representation independent propagator for general Lie groups.** — Un vol. relié, 16×23, de XVIII, 213 p. — ISBN 981-02-3355-8. — Prix: £22.00. — World Scientific, Singapore, 1998.

It is shown in this work that it is possible to introduce a *representation independent propagator* for a real, separable, connected and simply connected Lie group with irreducible, square integrable representations. For a given set of kinematical variables this propagator is a single generalized function independent of any particular choice of fiducial vector and the irreducible representations of the Lie group generated by these kinematical variables, which nonetheless, correctly propagates each element of a continous representation based on the coherent states associated with these kinematical variables.

Fonctions d'une variable complexe

Helmut FLORIAN, Klaus HACKL, Franz Josef SCHNITZER, Wolfgang TUTSCHKE, (Editors). — **Generalized analytic functions: theory and applications to mechanics.** — International Society for analysis, applications and computation, vol. 1. — Un vol. relié, 16,5×24,5, de XXVI, 311 p. —ISBN 0-7923-5043-X. — Prix: Dfl. 260.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The contributions on generalized analytic functions of these conference proceedings deal not only with problems in the complex plane but also related problems in higher dimensions which are investigated where both several complex variables and the technique of Clifford analysis are used. The second part of the proceedings is devoted to applications to mechanics. A substantial number of the papers of this part deal with problems in Ocean Acoustics.

Katsuhiko MATSUZAKI, Masahiko TANIGUCHI. — **Hyperbolic manifolds and Kleinian groups.** — Oxford mathematical monographs. — Oxford science publications. — Un vol. relié, 16×24, de IX, 253 p. — ISBN 0-19-850062-9. — Prix: £60.00. — Clarendon Press, Oxford, 1998.

This book is a comprehensive guide to the theory of Kleinian groups from the viewpoints of both geometry and analysis. A Kleinian group is a discrete subgroup of the isometry group of

hyperbolic 3-space; it can also be regarded as a subgroup of the group of Möbius transformations in the complex plane. The study of Kleinian groups has become an active area in mathematics and deals with many interesting theories. This book provides fundamental results and important theorems which are needed for access to the frontiers of the theory from a modern point of view.

Equations différentielles ordinaires

V.K. Dzyadyk. — **Approximation methods for solutions of differential and integral equations.** — Un vol. relié, 16,5×24,5, de 325 p. — ISBN 90-6764-194-4. — Prix: DM 259.00. — VSP, Utrecht, 1995.

This book is the result of 20 years of investigations, in order to bring closer and synthesize a number of well-known results, ideas and methods from the theory of function approximation, theory of differential and integral equations and numerical analysis. The book opens with an introduction on the theory of function approximation and is followed by a new approach to the Fredholm integral equations of the second kind. Several chapters are devoted to the construction of new methods for the effective approximation of solutions of several important integral, and ordinary and partial differential equations. In addition, new general results on the theory of linear differential equations with one regular singular point, as well as applications of the various new methods are discussed.

V. Lakshmikantham, A.S. Vatsala. — **Generalized quasilinearization for nonlinear problems.** — Mathematics and its applications, vol. 440 — Un vol. relié, 16,5×24,5, de ix, 276 p. — ISBN 0-7923-5038-3. — Prix: Dfl. 260.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The book provides a systematic development of the generalized quasilinearization indicating the notions and technical difficulties that are encountered in the unified approach. It enhances considerably the usefulness of the method of quasilinearization which has proved to be very effective in several areas of investigation and in applications. Further it includes the well known monotone iterative technique as a special case.

Equations aux dérivées partielles

A. Asanov and E.R. Atamanov. — **Nonclassical and inverse problems for pseudoparabolic equations.** — Inverse and ill-posed problems series. — Un vol. relié, 16,5×24, de 152 p. — ISBN 90-6764-235-5. — Prix: DM 150.00. — VSP, Utrecht, 1997.

The problems considered in this book are related to the theory of differential equations with partial derivatives from the ill-posed problem theory and are generally ill-posed in the Hadamard sense. The basic topic discussed is the conditional well-posedness of such problems. This represents the proof of uniqueness and stability theorems in the appropriate classes of functions. In some cases, existence theorems are also considered. The book opens with a chapter on the Cauchy problem with data in a time-like manifold for pseudoparabolic equations. Chapter 2 deals with interior problems for pseudoparabolic equations and the last chapter deals with inverse problems for operator pseudoparabolic equations.

E. Bainov, V. Covachev, (Editors). — **Proceedings of the fifth International Colloquium on Differential Equations: Plovdiv, Bulgaria, 18-23 August, 1994.** — Un vol. relié, 16,5×24,5, de vii, 362 p. — ISBN 90-6764-192-8. — Prix: DM 210.00. — VSP, Utrecht, 1995.

The colloquium was organized by UNESCO and the Plovdiv Technical University, with the help of many international mathematical organizations. This proceedings volume contains

selected invited talks which deal with the following topics: impulsive differential equations, differential equations with maxima, nonlinear differential equations, applications of differential equations.

D. BAINOV, (Editor). — **Proceedings of the seventh International Colloquium on Differential Equations: Plovdiv, Bulgaria, 18-23 August, 1996.** — Un vol. relié, 16,5×24,5, de IX, 468 p. — ISBN 90-6764-233-9. — Prix: DM 264.00. — VSP, Utrecht, 1997.

This proceedings volume contains selected talks which deal with various aspects of differential and partial differential equations. This book will be of value and interest to researchers and postgraduate students in the field of pure and applied mathematics, physics, biology, and engineering.

D. BAINOV, (Editor). — **Proceedings of the eighth International Colloquium on Differential Equations: Plovdiv, Bulgaria, 18-23 August 1997.** — Un vol. relié, 16,5×24,5, de IX, 439 p. — ISBN 90-6764-279-7. — Prix: DM 267.00. — VSP, Utrecht, 1998.

This proceedings volume contains selected talks which deal with various aspects of differential and partial differential equations. The book will be of value and interest to researchers and postgraduate students in the field of pure and applied mathematics, physics, biology and engineering.

Jean-Pierre BOURGUIGNON, Paolo de BARTOLOMEIS, Mariano GIAQUINTA, (Editors). — **Geometric theory of singular phenomena in partial differential equations.** — Symposia mathematica, vol. 38. — Un vol. relié, 16×24, de 182 p. — ISBN 0-521-63246-3. — Prix: £40.00. — Cambridge University Press, Cambridge, 1998.

Featuring contributions from a group of outstanding mathematicians, this book covers the most recent advances in the geometric theory of singular phenomena of partial differential equations occurring in real and complex differential geometry. Gathering together papers from a workshop held in Cortona, Italy, this volume will be of interest to all those whose research interests lie in real and complex differential geometry, partial differential equations, and gauge theory.

Jeffery M. COOPER. — **Introduction to partial differential equations with MATLAB.** — Applied and numerical harmonic analysis. — Un vol. relié, 16,5×24, de XV, 540 p. — ISBN 0-8176-3967-5. — Prix: SFr. 118.00. — Birkhäuser, Boston, 1998.

This advanced text/reference is an introduction to partial differential equations covering the traditional topics within a modern context. To provide an up-to-date treatment, techniques of numerical computation have been included with carefully selected nonlinear topics, including nonlinear first order equations. Each equation studied is placed in the appropriate physical context. The analytical and numerical aspects of solutions are discussed in an integrated fashion with extensive examples and exercises, both analytical and computational.

Christoph DORSCHFELDT. — **Algebras of pseudodifferential operators near edge and corner singularities.** — Mathematical research, vol. 102. — Un vol. broché, 17×24, de 202 p. — ISBN 3-527-40118-0. — Prix: DM 128.00. — Wiley-VCH, Berlin, 1998.

This book deals with analysis on manifolds with singularities. More precisely, it presents pseudodifferential operators near edges and corners. In particular, it considers parameter-dependent edge operators and edge operators of Mellin type. The investigation of such operator families is necessary to construct operator algebras on manifolds with higher singularities. A self-contained exposition in Mellin techniques and pseudodifferential operators with operator-valued symbols is given. The algebra of parameter-dependent edge operators is constructed.

Finally, Mellin operators near corner singularities are investigated. The focus is on elliptic theory. Elliptic operators on manifolds with edges are constructed as well as parametrices to elliptic elements.

Samuil D. EIDELMAN, Nicolae V. ZHITARASHU. — **Parabolic boundary value problems.** — Translated from the Russian by Gennady Pasechnik and Andrei Iacob. — Operator theory: advances and applications, vol. 101. — Un vol. relié, 17×24, de x, 295 p. — ISBN 3-7643-2972-6. — Prix: SFr. 198.00. — Birkhäuser Verlag, Basel, 1998.

The present monograph is devoted to the theory of general parabolic boundary problems. It starts with basic notions and various illustrative examples, followed by a detailed and systematic exposition of the L^2-theory of parabolic boundary value problems with smooth coefficients in Hilbert spaces of smooth functions and distributions of arbitrary finite order. A survey of the Cauchy problem and boundary value problem in spaces of smooth functions broadens the scope of the work. Special attention is paid to a detailed study of examples illustrating and complementing the theory.

Equations aux dérivées partielles et applications: articles dédiés à Jacques-Louis Lions. — Un vol. relié, 18×25, de vii, 808 p. — ISBN 2-84299-041-2. — Prix: FF 781.00 (Union européenne). — Gauthier-Villars/Editions scientifiques et médicales Elsevier, Paris, 1998.

Ce livre est une collection d'articles de recherche originaux, de niveau international, en mathématiques appliquées, et plus particulièrement en équations aux dérivées partielles. De nombreux domaines différents de ce vaste champ de recherche sont couverts: existence, régularité et stabilité d'équations aux dérivées partielles non linéaires; explosion en temps fini et formation de singularités; contrôle optimal et optimisation; contrôle de forme; sentinelles; problèmes de contrôlabilité; interpolation; théorie de la complexité; problèmes de mécanique des solides: élasticité, problèmes de vibration et d'acoustique; homogénéisation; problèmes de mécanique des fluides: équations d'Euler, équations de Navier-Stokes; problèmes de météorologie, de climatologie et d'océanographie; assimilation de données; analyse numérique: éléments finis, majorations d'erreur... Les articles ont été écrits par des élèves et de proches collaborateurs de Jacques-Louis Lions, Professeur au Collège de France, et lui sont dédiés à l'occasion de son soixante-dixième anniversaire. Les articles sont écrits en français et en anglais.

Alexander PANKOV. — *G*-**convergence and homogenization of nonlinear partial differential operators.** — Mathematics and its applications, vol. 422. — Un vol. relié, 16,5×24,5, de xiii, 249 p. — ISBN 0-7932-4720-X. — Prix: Dfl. 210.00. — Kluwer Academic Publishers, Dordrecht, 1997.

Chapter 1 is devoted to some preliminary issues from nonlinear analysis as well as to G-convergence of abstract operators, including the case of abstract parabolic operators. Chapter 2 introduces details of the notion of strong G-convergence for nonlinear second order elliptic operators in divergence form, and in Chapter 3 the homogenization problem for rapidly oscillated nonlinear random homogenous elliptic operators is dealt with. In Chapter 4, some of the previous results are extended to the case of nonlinear parabolic operators.

Endre PAP, Arpad TAKAČI, and Djiurdjica TAKAČI. — **Partial differential equations through examples and exercises.** — Kluwer texts in the mathematical sciences, vol. 18. — Un vol. relié, 16,5×25, de xii, 404 p. — ISBN 0-7923-4724-2. — Prix: Dfl. 320.00. — Kluwer Academic Publishers, Dordrecht, 1997.

This book examines the complicated subject of Partial Differential Equations (PDEs). It involves the reader throughout by presenting theory, examples and exercises together. Both the classical and abstract aspects of the theory are dealt with, so that, for example, classical and generalized solutions in Sobolev and distribution spaces are treated. Most of the work is devoted

to second or higher order PDEs, part of the distribution theory is included, covering Dirac's delta distribution "delta function". Many practical tools are offered for solving important problems with the basic three PDEs, namely the wave equation, the Laplace equation, the heat equation and their generalizations.

Isaak RUBINSTEIN, Lev RUBINSTEIN. — **Partial differential equations in classical mathematical physics.** — Un vol. broché, 18×25,5, de XIV, 677 p. — ISBN 0-521-55846-8. — Prix: £24.95 (relié: £70.00). — Cambridge University Press, Cambridge, 1998.

The unique feature of this book is that it considers the theory of partial differential equations in mathematical physics as the language of continuous processes, that is to say, as an interdisciplinary science that treats the hierarchy of mathematical phenomena as reflections of their physical counterparts. Special attention is drawn to tracing the development of these mathematical phenomena in different natural sciences, with examples drawn from continuum mechanics, electrodynamics, transport phenomena, thermodynamics, and chemical kinetics. At the same time, the authors trace the interrelation between the different types of problems – elliptic, parabolic, and hyperbolic – as the mathematical counterparts of stationary and evolutionary processes.

T.I. ZELENYAK, M.M. LAVRENTIEV Jr. and M.P. VISHNEVSKII. — **Qualitative theory of parabolic equations: Part 1.** — Un vol relié, 16,5×25, de 417 p. — ISBN 90-6764-236-3. — Prix: DM 266.00. — VSP, Utrecht, 1997.

In this publication only parabolic problems are considered. Here lie, mainly, the problems which have been investigated most thoroughly – the construction of Liapunov functionals which naturally generalize Liapunov functions for nonlinear parabolic equations of the second order with one spatial variable. The authors establish stabilizing solution theorems, and the necessary and sufficient conditions of general and asymptotic stability of stationary solutions, including the so-called critical case. Attraction domains for stable solutions of mixed problems for these equations are described. Furthermore, estimates for the number of stationary solutions are obtained.

Analyse de Fourier, analyse harmonique abstraite

Barbara Burke HUBBARD. — **The world according to wavelets: the story of a mathematical technique in the making.** — Second edition. — Un vol. relié, 16×24, de XX, 330 p. — ISBN 1-56881-072-5. — Prix: US$40.00. — A.K. Peters, Wellesley, Mass., 1998.

Over the past few years, a new mathematical language has been developing, its alphabet consisting of undulations called "wavelets". Today "the wavelet revolution" is enabling many mathematicians to perform a surprising variety of practical projects, from fingerprint encoding to recovering music from battered 19th century recordings. Lovingly crafted by an award-winning popular science writer, this second edition of a highly accessible, prizewinning book (winner of the French Mathematical Society's 1996 d'Alembert prize) retains its original appeal for non-mathematicians while incorporating expanded discussions of wavelet history, applications, and technical advances.

K.A. ROSS, J.M. ANDERSON, G.L. LITVINOV, A.I. SINGH, V.S. SUNDER, N.J. WILDBERGER, (Editors). — **Harmonic analysis and hypergroups.** — Trends in mathematics. — Un vol. relié, 16×24,5, de 249 p. — ISBN 0-8176-3943-8. — Prix: SFr. 178.00. — Birkhäuser, Boston, 1998.

Among the distinguished analysts from around the world who took part in the International New Delhi Conference on Harmonic Analysis were 21 participants whose papers comprise the proceedings of this volume. An underlying theme is the notion of hypergroups, the theory of

which has been developed and used in fields as diverse as special functions, differential equations, probability theory, representation theory, measure theory, Hopf algebras, and quantum groups. Other timely topics include the harmonic analysis of analytic functions, ergodic theory and wavelets.

Sundaram THANGAVELU. — **Harmonic analysis on the Heisenberg group.** — Progress in mathematics, vol. 159. — Un vol. relié, 16×24, de XII, 191 p. — ISBN 0-8176-4050-9. — Prix: SFr. 88.00. — Birkhäuser, Boston, 1998.

This monograph deals with various aspects of harmonic analysis on the Heisenberg group, which is the most commutative among the non-commutative Lie groups, and hence gives the greatest opportunity for generalizing the remarkable results of Euclidean harmonic analysis. The aim of this text is to demonstrate how the standard results of Abelian harmonic analysis take shape in the non-Abelian setup of the Heisenberg group. Several results in this monograph appear for the first time in book form, and some theorems have not appeared elsewhere. Topics covered include the Plancherel and Paley-Wiener theorems, spectral theory of the sublaplacian, Wiener-Tauberian theorems, Bochner-Riesz means and multipliers for the Fourier transform.

Equations intégrales

Andrei D. POLYANIN and Alexander V. MANZHIROV. — **Handbook of integral equations.** — Un vol. relié, 19×26, de XXVII, 787 p. — ISBN 0-8493-2876-4. — Prix: DM 228.00. — CRC Press, Boca Raton, Florida, distributed by Springer-Verlag, Berlin, 1998.

This book contains more than 2100 integral equations and their solutions and describes new exact solutions to linear and nonlinear equations. Integral equations are considered in relation to various fields of mechanics and theoretical physics, including elasticity, plasticity, hydrodynamics, heat and mass transfer, and electrodynamics. It outlines exact, approximate analytical, and numerical methods for solving linear and nonlinear integral equations and describes symbolic methods, singular integral equations, and translational integral equations. The book includes supplements, featuring properties of elementary and special functions, tables of indefinite and definite integrals, and tables of Laplace, Mellin, and other transforms.

Analyse fonctionnelle et théorie des opérateurs

Sheldon AXLER, John E. McCARTHY, Donald SARASON. — **Holomorphic spaces.** — Mathematical Sciences Research Institute publications, 33. — Un vol. relié, 16,5×24, de IX, 476 p. — ISBN 0-521-63193-9. — Prix: £35.00. — Cambridge University Press, Cambridge, 1998

This a collection of expository articles arising from MSRI's Fall 1995 program on holomorphic spaces. The opening article gives an overview of several aspects of the subject. The remaining articles, while more specialized, are nevertheless designed to be accessible to the non expert. A range of topics is addressed: Bergman spaces, Hankel operators in various guises, the Dirichlet space, subnormal operators, operators models, interpolation problems, systems theory. The concluding article describes an approach to certain commuting families of nonselfadjoint operators in which operator theory is linked with algebraic geometry.

David E. EVANS, Yasuyuki KAWAHIGASHI. — **Quantum symmetries on operator algebras.** — Oxford mathematical monographs. — Un vol. relié, 16×24, de XXV, 829 p. — ISBN 0-19-851175-2. — Prix: £105.00. — Oxford, Oxford University Press, 1998.

This is one of the first books to look at the remarkable connections recently made with knot theory, 3-manifolds, quantum groups and integrable systems in statistical mechanics and

conformal field theory. Focus is particularly put on the combinatorial-algebraic aspects, from the perspective of operator algebras. It will bring the reader to the frontline of research with the minimum of prerequisites from the classical theory.

Ram P. KANWAL. — **Generalized functions: theory and technique.** — Second edition. — Un vol. relié, 19×26, de IX, 462 p. — ISBN 0-8176-4006-1. — Prix: SFr. 168.00. — Birkhäuser, Boston, 1998.

This book contains both the theory and applications of generalized functions with a significant feature being the quantity and variety of applications. Definitions and theorems are stated precisely, but rigor is minimized in favor of comprehension of techniques. This edition has been strengthened in many ways. Various new concepts have been added. Some of the material from the first edition has been reorganized to improve the logical flow of ideas. And the set of examples has been expanded considerably to make more of the ideas concrete in the reader's eye.

Albrecht PIETSCH and Jörg WENZEL. — **Orthonormal systems and Banach space geometry.** — Encyclopedia of mathematics and its applications, vol 70. — Un vol. relié, 16×24, de IX, 553 p. — ISBN 0-521-62462-2. — Prix: £55.00. — Cambridge University Press, Cambridge, 1998.

The book describes the interplay between orthonormal expansions and Banach space geometry. Using harmonic analysis as a starting platform, classical inequalities and special functions are used to study orthonormal systems leading to an understanding of the advantages of systems consisting of characters on compact Abelian groups. Probabilistic concepts such as random variables and martingales are employed and Ramsey's theorem is used to study the theory of super-reflexivity. The text yields a detailed insight into concepts including type and co-type of Banach spaces, B-convexity, super-reflexivity, the vector valued Fourier transform and the unconditionality property for martingale differences (UMD).

L.A. SAKHNOVICH. — **Interpolation theory and its applications.** — Mathematics and its applications, vol. 428. — Un vol. relié, 17×24,5, de XVIII, 197 p. — ISBN 0-7923-4830-3. — Prix: Dfl. 185.00. — Kluwer Academic Publishers, Dordrecht, 1997.

This volume is devoted to the use of the method of operator identities for investigating interpolation and expansion problems. A general interpolation problem comprising both classical and new elements is formulated. The solution of an abstract form of the Potapov inequality enables the description of the set of solutions of the general interpolation problem. Connections between the solved interpolation problem and important problems of analysis, occurring in, for example, spectral theory, nonlinear integrable equations, and generalised stationary processes are then considered.

Géométrie

Izu VAISMAN. — **Analytical geometry.** — Series on university mathematics, vol. 8. — Un vol. relié, 16,5×22,5, de X, 284 p. — ISBN 981-02-3158-X. — Prix: £33.00. — Singapore, World Scientific, 1997.

The author proposes an alternative way of teaching either a first or a second course in geometry, which would develop analytical affine and Euclidean geometry, also including geometric transformations, and give an introduction to projective geometry. Furthermore, in this book the author also intends to advocate a return to the geometric patterns, teach students to perceive geometry as a world in itself, and develop their geometric intuition.

Géométrie différentielle

Alfred GRAY. — **Modern differential geometry of curves and surfaces with Mathematica®**. — Second edition. — Studies in advanced mathematics. — Un vol. relié, 19×26, de XXIV, 1053 p. — ISBN 0-8493-7164-3. — Prix: DM 177.00. — CRC Press, Boca Raton, Florida, distributed by Springer-Verlag, Berlin, 1998.

With this textbook the reader will learn to reproduce and study interesting curves and surfaces – many more than are included in typical texts – using computer methods. By plotting geometric objects and studying the printed result, readers can understand concepts geometrically and see the effect of changes in parameters. The new edition features 300 Mathematica® programs and more than 300 exercises to demonstrate concepts introduced in the book. It also adds eight new chapters on global curve theory, space curves, minimal surfaces, inversions, cyclides, the Gauss-Bonnet theorem, and global surface theory, with routines for displaying curves and surfaces using Geomview and Acrospin. The text presents many historical footnotes with portraits of mathematicians.

Frank MORGAN. — **Riemannian geometry: a beginner's guide**. — 2nd ed. — Un vol. relié, 16×23,5, de X, 156 p. — ISBN 1-56881-073-3. — Prix: US$ 34.00. — A.K. Peters, Wellesley, Mass., 1998.

The author establishes the basic material early to describe the most important geometric features of curved objects from the plebeian racetrack to the grand structure of the universe. In his short text, he then moves rapidly to address more complex topics like hyperbolic geometry and the Gauss-Bonnet theorem. This second edition contains a wealth of examples and exercises and includes new material on subjects ranging from isoperimetric problems to Einstein's original paper on general relativity. It concludes with a discussion of global geometry and current research (some by undergraduates) on energy minimizing curves and more.

Topologie des variétés, analyse globale et analyse des variétés

Robert FRIEDMAN, John W. MORGAN, (Editors). — **Gauge theory and the topology of four-manifolds**. — IAS/Park City mathematics series, vol. 4. — Un vol. relié, 18,5×26,5, de X, 221 p. — ISBN 0-8218-0591-6. — Prix: £28.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1998.

David Gieseker: Geometric invariant theory and the moduli of bundles. — Jun Li: Anti-self-dual connections and stable vector bundles. — John W. Morgan: An introduction to Gauge theory. — Ronald J. Stern: Computing Donaldson invariants. — Clifford H. Taubes and James A. Bryan: Donaldson-Floer theory.

P.R. MISRA, M. RAJAGOPALAN, (Editors). — **Proceedings of the Tennessee Topology Conference**. — Tennessee State University, June 10 and 11, 1996. — Un vol. relié, 16×23, de X, 224 p. — ISBN 981-02-3291-8. — Prix: £47.00. — World Scientific, Singapore, 1997.

There were five major speakers at the conference: Melvin Henriksen: Separate vs. joint continuity: a tale of four topologies. — I. Juhász: Cardinal functions on subspaces and continuous images. — K.D. Magill, Jr.: A survey of topological nearrings and nearrings of continuous functions. — Peter Nyikos: Topologies on trees. — K. Sundaresan: Backward shifts on function spaces. Keeping applications of topology in mind special sessions in the areas of asymmetric topologies and semigroup theory were organized. All the papers contained in the proceedings have been refereed.

Vladimir Y. ROVENSKII. — **Foliations of Riemannian manifolds and submanifolds.** — Un vol. relié, 16,5×24,5, de x, 286 p. — ISBN 0-8176-3806-7. — Prix: SFr. 138.00. — Birkhäuser, Boston, 1998.

The ideas and methods of foliations are very popular in mathematics and its applications. The key problem of this volume is the role of a Riemannian curvature in studies of manifolds and submanifolds with foliations. Rovenskii discusses the results of many geometers, but the book principally focuses on his own investigations into the Riemannian geometry of foliations and submanifolds with generators having nonnegative curvature. The main idea is that such manifolds are decomposed into a direct product when the dimension of leaves is sufficiently large.

Tatsuo SUWA. — **Indices of vector fields and residues of singular holomorphic foliations.** — Actualités mathématiques. — Un vol. broché, 17,5×24, de VIII, 204 p. — ISBN 2-7056-6361-4. — Prix: FF 210.00. — Hermann, Paris, 1998.

Vector fields arise naturally in many branches of mathematics. An interesting problem in geometry is to study the relation between the structure of the space and the property of vector fields that can exist on it. A typical example is the classical Poincaré-Hopf theorem, which relates the local indices of a vector field and the Euler-Poincaré characteristic of the manifold. More generally, we come up with foliations when we consider involutive systems of vector fields. For a holomorphic foliation, we have more local invariants (residues) associated to its singularity, as initially discovered by P. Baum and R. Bott. Also, for an invariant subvariety of the foliation we have other types of residues, including the Camacho-Sad index, which play a significant role in the study of invariant subvarieties. In this book these invariants are treated systematically and generalized to the ones for vector fields and holomorphic foliations on singular varieties.

Masaya YAMAGUTI, Masayoshi HATA, and Jun KIGAMI. — **Mathematics of fractals.** — Translations of mathematical monographs, vol. 167. — Un vol. relié, 18×26, de XI, 78 p. — ISBN 0-8218-0537-1. — Prix: £19.50. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

This book aims at providing a handy explanation of the notions behind the self-similar sets called "fractals" and "chaotic dynamical systems". The authors emphasize the beautiful relationship between fractal functions (such as Weierstrass's) and chaotic dynamical systems; these nowhere-differentiable functions are generating functions of chaotic dynamical systems. These functions are shown to be in a sense unique solutions of certain boundary problems. The last chapter of the book treats harmonic functions on fractal sets.

Probabilités et processus stochastiques

A.A. BOROVKOV. — **Ergodicity and stability of stochastic processes.** — Translated by V. Yurinsky. — Wiley series in probability and statistics. — Un vol. relié, 16×23,5, de XXIII, 585 p. — ISBN 0-471-97913-9. — Prix: £85.00.— John Wiley & Sons, Chichester, 1998.

Comprising three parts, the first demonstrates the general theorems of ergodicity and stability for a comprehensive number of classes of Markov chains, stochastically recursive sequences and their generalizations. Expanding on the introduction, the second part considers ergodicity and stability of multi-dimensional Markov chains and Markov processes. For one-dimensional Markov chains special attention is paid to large deviation problems and transient phenomenon. Drawing upon the results presented throughout the book the final part considers

their application in establishing conditions of ergodicity in communication and queueing networks. In particular, two types of polling systems are considered; Jackson networks and buffered random access systems related to the ALOHA algorithm.

Anton BOVIER, Pierre PICCO, (Editors). — **Mathematical aspects of spin glasses and neural networks.** — Progress in probability, vol. 41. — Un vol. relié, 16,5×24, de VIII, 382 p. — ISBN 0-8176-3863-6. — Prix : SFr. 178.00. — Birkhäuser, Boston, 1998.

Spin glass theory has been an extremely active field of research in both experimental and theoretical physics for many years. Soon after introduction of the first spin glass models, the close relationship between spin glasses and certain aspects of the theory of neural networks was discovered. The aim of this book is to provide a concise reference to the mathematical progress that has been made on the interaction between these two concepts. It provides the researcher or beginning graduate student with a survey of some of the most important developments as focused on intrinsically spin glass aspects.

Norbert HENZE, Hans RIEDWYL. — **How to win more: strategies for increasing a lottery win.** — Un vol. broché, 13×20,5, de X, 149 p. — ISBN 1-56881-078-4. — Prix : US$ 15.95. — A.K. Peters, Wellesley, Mass., 1998.

This book is designed to provide valuable insight into how to improve the return on your investment when playing the lottery. While it does not promise that you will win more often, it does show you to improve the odds of winning larger sums when your numbers come up. So, when you finally do win that million dollar jackpot, you will be less likely to have to share it with anyone else.

Josef HOFBAUER, Karl SIGMUND. — **Evolutionary games and population dynamics.** — Un vol. broché, 17×24,5, de XXVII, 323 p. — ISBN 0-521-62365-0 (relié), 0-521-62570-X (broché). — Prix : £ 16.95 (relié : £ 50.00). — Cambridge University Press, Cambridge, 1998.

In this book the authors investigate the nonlinear dynamics of the self-regulation of social and economic behaviour, and of the closely related interactions between species in ecological communities. Replicator equations describe how successful strategies spread and thereby create new conditions which can alter the basis of their success, i.e. to enable us to understand the strategic and genetic foundations of the endless chronicle of invasions and extinctions which punctuate evolution. In short, evolutionary game theory describes when to escalate a conflict, how to elicit cooperation, why to expect a balance of the sexes, and how to understand natural selection in mathematical terms.

Yu.M. KABANOV, B.L. ROZOVSKII, A.N. SHIRYAEV, (Editors). — **Statistics and control of stochastic processes. The Lipster Festschrift.** — Steklov Mathematical Institute, 1995-1996. — Proceedings of Steklov Mathematical Institute Seminar. — Un vol. relié, 156×23, de XXI, 354 p. — ISBN 981-02-3292-6. — Prix : £ 60.00. — World Scientific, Singapore, 1997

Yu. M. Kabanov et al.: Robert Liptser. — A. Dembo, O. Zitouni: Moderate deviations for iterates of expanding maps. — N.G. Duffield et al.: The branching diffusion approximation for a model of a synchronized queueing network. — K. Dzhaparidze et al.: On Hellinger processes for parametric families of experiments. — I.V. Evstigneev, S. Flåm: The turnpike property and

the central limit theorem in stochastic models of economic dynamics. — S. Frason, W.J. Runnggaldier: A stochastic control model for hedging in incomplete markets. — L. Galtchouk, V. Konev: On sequential estimation of parameters in continuous-time stochastic regression. — M Huebner *et al.*: Asymptotic properties of an approximate maximum likelihood estimator for stochastic PDEs. — P. Imkeller: Enlargement of the Wiener filtration by a manifold valued random element via Malliavin's calculus. — etc...

Yu A. ROZANOV. — **Random fields and stochastic partial differential equations.** — Mathematics and its applications, vol. 438. — Un vol. relié, 16,5×25, de VII, 229 p. — ISBN 0-7923-4984-9. — Prix: Dfl. 195.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book considers some models described by means of partial differential equations and boundary conditions with chaotic stochastic disturbance. In a framework of stochastic partial differential equations an approach is suggested to generalize solutions of stochastic boundary problems. The main topic concerns probabilistic aspects with applications to the most well-known random fields models which are representative for the corresponding stochastic Sobolev spaces.

Statistique

D.R. BRILLINGER, L.T. FERNHOLZ, S. MORGENTHALER, (Editors). — **The practice of data analysis: essays in honor of John W. Tukey.** — Un vol. relié, 16,5×24, de VIII, 337 p. — ISBN 0-691-05782-6. — Prix: US$49.50. — Princeton University Press, Princeton, 1998.

This book honors John W. Tukey, one of the most influential statisticians of the twentieth century, on the occasion of his eightieth birthday. Contributors, some of them Tukey's former students, use his general theoretical work and his specific contributions to Exploratory Data Analysis as the point of departure for their papers. They cover topics from "pure" data analysis, such as gaussianizing transformations and regression estimates, and from "applied" subjects, such as the best way to rank the abilities of chess players or to estimate the abundance of birds in a particular area.

Ian L. DRYDEN, Kanti V. MARDIA. — **Statistical shape analysis.** — Wiley series in probability and statistics. — Un vol. relié, 16×23,5, de XVII, 347 p. — ISBN 0-471-95816-6. — Prix: £60.00. — John Wiley, Chichester, 1998.

This book involves methods for the geometrical study of random objects where location, rotation and scale information can be removed. It lays the foundations of the subject discussing key ideas and the very latest developments, as well as offering practical guidance and comparisons of techniques. The text primarily concentrates on landmark data – key points of correspondence located on each object. Careful consideration of the similarity invariances requires methods appropriate for non-Euclidean data analysis. In particular, multivariate statistical procedures cannot be applied directly, but can be adapted in certain instances.

B.S. EVERITT. — **The Cambridge dictionary of statistics.** — Un vol. relié, 18×25, de VIII, 360 p. — ISBN 0-521-59346-8. — Prix: £19.95. — Cambridge University Press, 1998.

Some 3000 terms are defined in all areas of statistics, including medical, survey, theoretical, applied and so on. In addition short biographies are given of over 100 important statisticians. The majority of definitions include a reference to a book or article where the reader can seek an

extended account of a term if required. Many of the definitions are accompanied by graphical material to aid understanding. The book is a 50% expansion of Everitt's earlier dictionary.

David GRIFFITHS, W. Douglas STIRLING, K. Laurence WELDON. — **Understanding data: principles & practice of statistics.** — Un vol. broché, 18 × 24,5, de XIV, 401 p. — ISBN 0-471-33734-X. — Prix: £24.95. — John Wiley, Chichester, 1998.

This textbook is intended for introductory courses in statistics. It provides concepts and tools that will enable students to analyse data intelligently. The text provides a serious introduction to applied statistics that will suit any student. Statistical concepts and tools are best learned through guided experiences in data analysis. Emphasis is placed on collection, display, examination, summary and presentation of data before developing mathematical and inferential data. The level of mathematics is kept to a minimum, yet the concepts necessary for an understanding of statistics are carefully explained. This understanding is exercised in all aspects of the book.

Wiebe R. PESTMAN. — **Mathematical statistics: an introduction.** — De Gruyter textbook. — Un vol. broché, 17 × 24, de IX, 545 p. — ISBN 3-11-015356-4. — Prix: DM 79.00. — Walter de Gruyter, Berlin, 1998.

The text covers compulsory fundamental topics like estimation theory, sufficiency, hypothesis testing, analysis of variance, and non-parametric methods. Moreover, there are also introductory sections, about the Kolmogorov-Smirnov test, von Mises differentiation, influence functions, robustness, metrics on sets of distribution functions, smoothing techniques, bootstrap methods, and density estimation. The final chapter of the book contains a first course in vectorial statistics and multiple regression analysis.

Wiebe R. PESTMAN, Ivo B. ALBERINK. — **Mathematical statistics: problems and detailed solutions.** — De Gruyter textbook. — Un vol. broché, 17 × 24, de IX, 325 p. — ISBN 3-11-015358-0. — Prix: DM 79.00. — Walter de Gruyter, Berlin, 1998.

This book contains some 250 problems in mathematical statistics, varying in difficulty, together with their solutions. The book is primarily intended as a solutions manual to the textbook *Mathematical statistics – an introduction* (de Gruyter 1998), which also includes the problems. The text can be used by mathematics, natural science and economics students who have mastered the topics of a first-year course in calculus and linear algebra.

Analyse numérique

Yu.E. ANIKONOV, B.A. BUBNOV and G.N. EROKHIN. — **Inverse and ill-posed sources problems.** — Inverse and ill-posed problems series. — Un vol. relié, 16,5 × 24,5, de 239 p. — ISBN 90-6764-273-8. — Prix: DM 187.00. — VSP, Utrecht, 1997.

In this book, the authors have considered different settings of inverse problems of mathematical physics, both in linear and nonlinear cases. Emphasis is given to unique solvability and the search for constructive methods. In general, the problems considered are multidimensional. Effective methods for source recovery are given for sources of different nature. The suggested methods and results will be valuable for the development of both theoretical and practical problems of simulation and determining the sources on the basis of multidimensional inverse problems of mathematical physics.

D. Bainov and V. Kovachev, (Editors). — **Proceedings of the third International Colloquium on Numerical Analysis: Plovdiv, Bulgaria, 13-17 August, 1994.** — Un vol. relié, 16,5×24, de 229 p. — ISBN 90-6764-193-6. — Prix: DM 161.00. — VSP, Utrecht, 1995.

The third International Colloquium on Numerical Analysis was organized by UNESCO and the Plovdiv Technical University, with the help of many international mathematical organizations. This proceedings volume contains selected invited talks which deal with the following topics: numerical methods of algebra, analysis, ordinary and partial differential equations. This book will be of value and interest to researchers and postgraduate students in the field of applied and pure mathematics, computer science and engineering.

John P. Boyd. — **Weakly nonlocal solitary waves and beyond-all-orders asymptotics: generalized solitons and hyperasymptotic perturbation theory.** — Mathematics and its applications, vol. 442. — Un vol. relié, 17×25, de XIX, 590 p. — ISBN 0-7923-5072-3. — Prix: Dfl.450.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This text represents the first thorough examination of weakly nonlocal solitary waves. The book describes a class of waves which radiate away from the core of the disturbance but are nevertheless very long-lived nonlinear disturbances. Specific examples are provided in the areas of water waves, particle physics, dynamical systems theory, etc. A second theme is the description of hyperasymptotic perturbation theory and other extensions of standard perturbation methods. A third theme involves the use of Chebyshev and Fourier numerical methods to compute solitary waves. A fourth theme is the description of a large number of non-soliton problems in quantum physics, hydrodynamics, instability, etc. Later chapters provide a thorough examination of matched asymptotic expansions in the complex plane, the small denominator problem in Poincaré-Linstead ("Stokes") expansions, multiple scale extensions in powers of the hyperbolic secant and tangent functions and hyperasymptotic perturbation theory.

A. Iserles, (Editor). — **Acta numerica,** vol. 7, 1998. — Un vol. relié, 18×25,5, de 377 p. — ISBN 0-521-64316-3. — Prix: £40.00. — Cambridge University Press, Cambridge, 1998.

Russel E. Caflisch: Monte Carlo and quasi-Monte Carlo methods. — Ronald A. De Vore: Nonlinear approximation. — Ilse C.F. Ipsen: Relative perturbation results for matrix eigenvalues and singular values. — Heinz-Otto Kreiss and Jens Lorenz: Stability for time-dependent differential equations. — M.J.D. Powell: Direct search algorithms for optimization calculations. — G.A. Watson: Choice of norms for data fitting and function approximation.

Joseph W. Jerome, (Editor). — **Modelling and computation for applications in mathematics, science, and engineering.** — Numerical mathematics and scientific computation. — Un vol. relié, 16,5×24, de XI, 215 p. — ISBN 0-19-850080-7. — Prix: £55.00. — Clarendon Press, Oxford, 1998.

This book provides a wide cross-section of the interdisciplinary uses of mathematics at a high level. The strength of the volume is its development of cutting-edge topical applications, studied with advanced numerical and algorithmic techniques, in a rigorous mathematical setting. The contributors are outstanding applied and computational mathematicians. Researchers and students of applied mathematics, and scientists and engineers engaged in scientific computing, will find here both fruitful areas for further research and clear expositions of topical subjects.

V.P. TANANA. — **Methods for solution of nonlinear operator equations.** — Inverse and ill-posed problems series. — Un vol. relié, 17×25, de 241 p. — ISBN 90-6764-272-X. — Prix: DM 189.00. — VSP, Utrecht, 1997.

Although there a large number of works devoted to nonlinear theory of ill-posed problems, there are few applications of this theory. In this monograph the author tries to solve this problem by considering the widest class of nonlinear equations and systems which play an important role in applications. For this class of equations the general regularization theory is constructed, and the problem of finite-dimensional approximations of regularized solutions is solved.

V.P. TANANA. — **Methods for solving operator equations.** — Inverse and ill-posed problems series. — Un vol. relié, 16,5×24,5, de 223 p. — ISBN 90-6764-237-1. — Prix: DM 205.00. — VSP, Utrecht, 1997.

This monograph thoroughly investigates the methods for solving linear operator equations from the viewpoint of their stability relative to disturbance of the initial information. It focuses the operator equations: $Au = f$, where u, f are desired and given elements of certain metric spaces (U and F respectively), and A is given operator acting from U onto F. The concept of an optimum to a method for solving the equation $Au = f$ with an approximately given operator is introduced and an analysis of the methods from the viewpoint of their optimums is pursued. Problems of regularizing operator equations with a disturbance in the operator are considered. General schemes for finite-dimensional approximation of regularized solutions are also formulated and investigated.

G. WINTHER ALTHAUS and E. SPEDICATO. — **Algorithms for large scale linear algebraic systems: applications in science and engineering.** — NATO ASI series, Series C: Mathematical and physical sciences, vol. 508. — Un vol. relié, 16,5×24,5, de VI, 407 p. — ISBN 0-7923-4975-X. — Prix: Dfl. 335.00. — Kluwer Academic Publishers, Dordrecht, 1998.

An overview of the most successful algorithms and techniques for solving large, sparse systems of equations and some algorithms and strategies for solving optimization problems. The most important topics dealt with concern iterative methods, especially Krylov methods, ordering techniques, and some iterative optimization tools.

Informatique

Kevin R. COOMBES, Brian R. HUNT, Ronald L. LIPSMAN, John E. OSBORN, Garrett J. STUCK. — **The *Mathematica*® primer.** — Un vol. broché, 19,5×23, de XVII, 214 p. — ISBN 0-521-63715-5. — Prix: £16.95 (relié: £50.00). — Cambridge University Press, Cambridge, 1998.

This book is a short, focused introduction to *Mathematica*®. Written for the beginning user, this engaging book contains an explanation of essential *Mathematica*® commands and interface. *Mathematica*® can be used to graph functions, solve equations, perform statistical tests, etc. In addition, it incorporates word processing and desktop publishing features for combining mathematical computations with text and graphics. You can even use it to create documents and graphics for the Web. Written for Version 3 of the program, this book can be used with earlier versions of *Mathematica*®·

Mécanique des particules et systèmes

Christian GRUBER, Willy BENOIT. — **Mécanique générale.** — Nouvelle édition revue et augmentée. — Un vol. broché, 16×24, de XVI, 736 p. — ISBN 2-88074-305-2. — Prix: SFr. 114.00. — Presses polytechniques et universitaires romandes, Lausanne, 1998.

Cet ouvrage est un exposé didactique de la mécanique classique rédigé avec deux soucis constants: relier le formalisme mathématique aux concepts fondamentaux et introduire la mécanique comme base de la physique. La première partie présente le cadre général de la physique. La description du mouvement et les lois de la dynamique sont ensuite introduites à partir de l'observation et conduisent à l'approche moderne, fondée sur les principes d'invariance et les lois de conservation. Le livre se termine par une introduction aux méthodes de la mécanique relativiste et lagrangienne.

Mécanique des solides, élasticité et plasticité

L.B. FREUND. — **Dynamic fracture mechanics.** — Cambridge monographs on mechanics and applied mathematics. — Un vol. broché, 15×22,5, de XVII, 563 p. — ISBN 0-521-62922-5. — Prix: £24.95 (relié: £65.00). — Cambridge University Press, Cambridge, 1998.

This volume emphasizes fundamental concepts, both on the development of mathematical models of fracture phenomena and on the analysis of these models. Cases involving stress waves impinging on cracks, tractions suddenly applied to the faces of cracks, and rapid crack growth and arrest are considered in detail. Most of the work is concerned with the behavior of nominally elastic materials but available results on elastic-plastic and elastic-viscoplastic materials are included.

Mécanique des fluides, acoustique

Peter G. BAINES. — **Topographic effects in stratified flows.** — Cambridge monographs on mechanics. — Un vol. broché, 15×23, de XVI, 482 p. — ISBN 0-521-62923-3. — Prix: £24.95 (relié: £55.00). — Cambridge University Press, Cambridge, 1998.

With an emphasis on both theory and experiment, this text describes the behavior of homogeneous and density-stratified fluids over and around topography. In examining the similarities between the flow of a river over a barrier or weir and the flow of the atmosphere over a mountain range, this book presents a comprehensive synthesis of the topic in terms suitable for scientists, engineers, teachers, and students of fluid dynamics. Using the appropriate mathematics, experiments, and illustrations, the text describes the properties of stratified flows beginning with the simplest situations – such as the flow of homogeneous layer with a free surface, the prototype system for conventional hydraulics – and proceeding to progressively more complex ones, such as the flow of stratified fluid over two- or three-dimensional topography.

K. NAUGOLNYKH, L. OSTROVSKI. — **Nonlinear wave processes in acoustics.** — Cambridge texts in applied mathematics. — Un vol. broché, 15,5×23, de X, 298 p. — ISBN 0-521-39984-X. — Prix: £19.95. — Cambridge University Press, Cambridge, 1998.

The study of nonlinear phenomena, such as explosions and jet engines, prompted the sharp growth of interest in nonlinear acoustic phenomena. The authors consider models of different "acoustic" media as well as equations and behavior of finite amplitude waves. Consideration is given to the effects of nonlinearity, dissipation, and dispersion and for two- and three-dimensional problems, reflection, and diffraction upon the evolution and interaction of acoustic beams.

Physique statistique, structure de la matière

Hervé KUNZ. — **Matrices aléatoires en physique.** — Cahiers de physique, vol. 3. — Un vol. broché, 15×21, de VIII, 84 p. — ISBN 2-88074-373-7. — Prix : SFr. 38.00. — Presses polytechniques et universitaires romandes, Lausanne, 1998.

Cet ouvrage propose une introduction à la théorie des matrices aléatoires et à ses applications en physique, notamment dans le domaine du chaos quantique. L'universalité des corrélations à courte distance pour une large classe de modèles est montrée. Les résultats sont obtenus non seulement par les méthodes classiques de Wigner, Gaudin, Mehta, Dyson, mais également par la méthode supersymétrique d'Efetov, qui est présentée de manière détaillée et soigneuse. Cet ouvrage s'adresse principalement aux physiciens ainsi qu'aux mathématiciens.

Economie, recherche opérationnelle, jeux

Alexander P. ABRAMOV. — **Connectedness and necessary conditions for an extremum.** — Mathematics and its applications, vol. 431. — Un vol. relié, 16,5×24,5, de XI, 199 p. — ISBN 0-7923 4910-5. — Prix : Dfl. 175.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This monograph is the first book in the study of necessary conditions of an extremum in which topological connectedness plays a major role. Many new and original results are presented here. The synthesis of the well-known Dybrovitskii-Milyutin approach, based on functional analysis, and topological methods permits the derivation of the so-called alternative conditions of an extremum. Examples from mathematical economics illustrate the alternative conditions of any extremum. Parallels are drawn between these examples and the problems of static equilibrium in classical mechanics.

Ana Isabel BARROS. — **Discrete and fractional programming techniques for location models.** — Combinational optimization, vol. 3. — Un vol. relié, 16,5×24, de XVIII, 178 p. — ISBN 0-7923-5002-2. — Prix : Dfl. 180.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The book integrates two seemingly unrelated fields : location analysis and fractional programming. Location analysis deals with the problem where to locate facilities in such a way as to optimize a particular criterion taking into account the existing clients. Fractional programming is a special field of nonlinear programming dealing with optimization problems where the objective function consists of a ratio of given functions. Those interested in location theory will find not only new results in discrete location, especially in two-level location models, but also the theoretical and practical potential of fractional programming in location theory. Those in the field of fractional programming will find a clear and geometrical interpretation of the basic techniques of fractional and generalized fractional programming and new theoretical duality results that lead to efficient and innovative algorithms.

Franco GIANNESSI, Sándor KOMLÓSI, Tamás RAPSÁK, (Editors). — **New trends in mathematical programming : homage to Steven Vajda.** — Applied optimization, vol. 13. — Un vol. relié, 16,5×25, de XI, 314 p. — ISBN 0-7923-5036-7. — Prix : Dfl. 260.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book is dedicated to the memory of Stephan Vajda, one of the pioneers of mathematical programming, who was born in Hungary. The twenty-two invited chapters written by thirty-six authors from twelve countries provide the reader with an insight into recent advances in mathematical programming. This book is addressed to researchers and postgraduate students with an interest in the theoretical and algorithmic aspects of the field.

Mark Sh. LEVIN. — **Combinatorial engineering of decomposable systems.** — Combinatorial optimization, vol. 2. — Un vol. relié, 17×25, de XX, 371 p. — ISBN 0-7923-4950-4. — Prix: Dfl. 320.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book presents a morphological approach to the combinatorial design/synthesis of decomposable systems. Applications involve the following: design (e.g., information systems; user's interface; educational courses); planning (e.g., problem solving strategies; product life cycles; investment); metaheuristics for combinatorial optimization; information retrieval, etc.

Biaggio RICCERI, Stephen SIMONS, (Editors). — **Minimax theory and applications.** — Nonconvex optimization and its applications, vol. 26. — Un vol. relié, 16,5×24,5, de IX, 270 p. — ISBN 0-7923-5064-2. — Prix: Dfl. 220.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume contains the proceedings of the workshop on *Minimax Theory and Applications*, held from September 30 to October 6, 1996, in Erice, Italy. The book deals mainly with classical minimax theory, reflecting on current trends in the basic theory. In particular, the role of connectedness, which replaces that of convexity appearing in most classical results, is clearly emerging. The applications concern, among other things, game theory, integral functionals and monotone operators.

Naum Z. SHOR. — **Nondifferentiable optimization and polynomial problems.** — Nonconvex optimization and its applications, vol. 24. — Un vol. relié, 17×24,5, de XVII, 394 p. — ISBN 0-7923-4997-0. — Prix: Dfl. 330.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The book is devoted to investigation of polynomial optimization problems including boolean problems which are the most important part of mathematical programming. It is shown that the methods of nondifferentiable optimization can be used for finding solutions of many classes of polynomial problems and for obtaining good dual estimates for optimal objective value in these problems.