Zeitschrift: L'Enseignement Mathématique

Herausgeber: Commission Internationale de l'Enseignement Mathématique

Band: 45 (1999)

Heft: 1-2: L'ENSEIGNEMENT MATHÉMATIQUE

Rubrik: BULLETIN BIBLIOGRAPHIQUE

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Mehr erfahren

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. En savoir plus

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. Find out more

Download PDF: 16.10.2025

ETH-Bibliothek Zürich, E-Periodica, https://www.e-periodica.ch

BULLETIN BIBLIOGRAPHIQUE

Généralités

Charles ANTOINE. — **Les moyennes.** — Que sais-je?, vol. 3383. — Un vol. broché, 11×17,5, de 127 p. — ISBN 2-13-049305-X. — Prix: FF 42.00. — Presses universitaires de France, Paris, 1998.

Cet ouvrage analyse le concept de moyenne par ses aspects philosophiques, historiques, linguistiques et mathématiques; par ses usages en sciences expérimentales et fondamentales; par l'exposé de l'art de la proportion et des proportions en art depuis les Grecs. Pour ce faire, cette étude utilise des exemples d'usages courants et publics: médias, écoles, systèmes électoraux en expliquant la pratique de l'exemple: le choix, le calcul, la signification et l'interprétation.

V.I. ARNOLD, G.-M. GREUBEL, J.H.M. STEENBRINK, (Editors). — **Singularities: the Brieskorn anniversary volume.** — Progress in mathematics, vol. 162. — Un vol. relié, 16×24, de XXV, 458 p. — ISBN 3-7643-5913-7. — Prix : SFr. 128.00. — Birkhäuser Verlag, Basel, 1998.

In July 1996, a conference was organized by the editors of this volume at the Mathematisches Forschungsinstitut Oberwolfach to honor Egbert Brieskorn on the occasion of his 60th birthday. This volume contains papers on singularity theory and its applications, written by the participants of the conference. In many cases, they are extended versions of the talks presented there. The diversity of subjects of the contributions reflects singularity theory's relevance to topology, analysis and geometry, combining ideas and techniques from all of these fields, as well as demonstrates the breadth of Brieskorn's own interests.

Michael ARTIN. — **Algebra.** — Aus dem Englischen übersetzt von Annette A'Campo. — Grundstudium Mathematik. — Un vol. broché, 17×24, de XIII, 705 p. — ISBN 3-7643-5938-2. — Prix: SFr. 58.00. — Birkhäuser Verlag, Basel, 1998.

Diese Einführung in lineare Algebra und Algebra ist über viele Jahre aus den Vorlesungsnotizen des Autors gewachsen und zeichnet sich aus durch einen harmonischen Aufbau des behandelten Stoffes. Als eine Besonderheit umfasst dieser nebst den üblichen Inhalten auch die Betonung spezieller Themen wie Symmetrie, lineare Gruppen und quadratische Zahlkörper. Der Text besticht insbesondere durch eine für den Studenten besonders verständliche Präsentation des Stoffes. Zahlreiche Beispiele und Übungsaufgaben erhöhen seinen Wert.

A. BALOG, G.O.H. KATONA, A. RECSKI, D. SZA'SZ, (Editors). — **European Congress of Mathematics.** — Budapest, July 22-26, 1996. — Progress in mathematics, vol. 168, 169. — 2 vol. reliés, 16,5×24, de XIX, 334 p. et VIII, 402 p. — ISBN 3-7643-5496-8. — Prix: SFr. 268.00, l'ensemble des deux volumes. — Birkhäuser Verlag, Basel, 1998.

The first volume of the proceedings of the second European Congress of Mathematics presents the speeches delivered at the Congress, the list of lectures, and short summaries of the achievements of the prize winners. Together with volume II it contains a collection of

contributions by the invited lecturers. Finally, volume II also presents reports on some of the Round Table discussions. This two-volumes set thus gives an overview of the state of the art in many fields of mathematics and is therefore of interest to every professional mathematician.

Robert R. BANKS. — **Towing icebergs, falling dominoes, and other adventures in applied mathematics.** — Un vol. relié, 16,5×24, de XI, 328 p. — ISBN 0-691-05948-9. — Prix: US$29.95. — Princeton University Press, Princeton, 1998.

The author shows how math and simple reasoning together may produce elegant models which explain everything from the federal debt to the proper technique for ski-jumping. He offers us a plethora of ponderables, both practical and pleasing: How tall can one grow? Why do we get stuck in trafic? Which football player would have a better chance of breaking away — a small, speedy wide receiver or a huge, slow linebacker? Can California water shortages be alleviated by towing icebergs from Antarctica? There are questions here for everyone, and happily only a basic understanding of high school or college math is required to follow Banks' solutions; none at all to enjoy his chatty style and points of interest.

Gilles CHRISTOL, Anne COT, Charles-Michel MARLE. — **Calcul différentiel.** — Mathématiques pour le 2e cycle. — Un vol. broché, 17,5×26, de VII, 216 p. — ISBN 2-7298-6751-1. — Prix: FF 140.00. — Ellipses, Paris, 1997.

La collection *Mathématiques 2e cycle* se propose de mettre à la disposition des étudiants de licence et de maîtrise de mathématiques des ouvrages couvrant l'essentiel des programmes actuels des universités françaises. Les auteurs ont voulu rendre ces livres accessibles à tous: les sujets traités sont présentés de manière simple et progressive, tout en respectant scrupuleusement la rigueur mathématique. Chaque volume comporte un exposé du cours avec des démonstrations détaillées de tous les résultats essentiels, et de nombreux exercices.

Manfred DROSTE and Rüdiger GÖBEL, (Editors). — **Advances in algebra and model theory.** — Selected surveys presented at conferences in Essen 1994 and Dresden 1995. — Algebra, logic and applications, vol. 9. — Un vol. relié, 16×24, XII, 499 p. — ISBN 90-5699-101-9. — Prix: £62.00. — Gordon and Breach Science Publishers, Amsterdam, distributed by Marston Book Services, Abingdon, Oxon, U.K., 1998.

The book contains 25 surveys and research articles on algebra and model theory. The topics include field and ring theory as well as groups, ordered algebraic structure and their relationship to model theory. Several papers deal with infinite permutation groups, abelian groups, modules and their relatives and representations, categorical structures and Boolean algebras. Model theoretic aspects include quantifier elimination in skew fields, Hilbert's 17th problem. Moreover symmetry questions and automorphism groups of orders are covered.

Bertrand HAUCHECORNE, Daniel SURATTEAU. — **Des mathématiciens de A à Z.** — Un vol. broché, 17,5×26, de 381 p. — ISBN 2-7298-4683-2. — Prix: FF 170.00. — Ellipses, Paris, 1996.

Ceux qui s'intéressent aux mathématiques connaissent le plus souvent les mathématiciens par les notions et les théorèmes auxquels on a donné leur nom. Pour beaucoup ces noms restent déshumanisés comme le montrent des expressions souvent entendues comme «on applique Bézout» ou «en schmidtant la base canonique». Ce livre rassemble plus de six cents biographies de mathématiciens de toutes les époques. De nombreuses anecdotes, souvent amusantes, parfois pathétiques, accompagnent les biographies principales.

Yusupdjan KHAKIMDJANOV, Michel GOZE and Shavkat A. AYUPOV, (Editors). — **Algebra and operator theory.** — Proceedings of the Colloquium in Tashkent, 1997. — Un vol. relié, 16,5×24,5, de VIII, 250 p. — ISBN 0-7923-5094-4. — Prix: Dfl. 210.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume presents the lectures given during the second French-Uzbek Colloquium on Algebra and Operator Theory which took place in Tashkent in 1997, at the Mathematical Institute of the Uzbekistan Academy of Sciences. Among the algebraic topics discussed here are deformation of Lie algebras, cohomology theory, the algebraic variety of the laws of Lie algebras, Euler equations on Lie algebras, Leibniz algebras, and real K-theory. Some contributions have a geometrical aspect, such as supermanifolds. Certain types of operator algebras are considered. This volume also contains a detailed introduction to the theory of quantum groups.

Yvon L'HOSPITALIER. — **Enigmes et jeux logiques: résolution et construction.** — Un vol. broché, 15,5×24, de 178 p. — ISBN 2-212-03639-6. — Prix: FF 128.00. — Eyrolles, Paris, 1998.

L'ouvrage propose de comprendre le fonctionnement des jeux logiques en exposant les principes mathématiques qui président à leur construction. Il permet ainsi à la fois: de résoudre des problèmes et énigmes par les méthodes de résolution les plus courantes, de construire soi-même des énigmes à partir d'une structure abstraite ou à partir d'une énigme existante grâce au principe d'analogie. On découvre ainsi de nombreux outils de représentation de l'information (tableaux, graphes, diagrammes de Venn et de Karnaugh, filotrames, connecteurs logiques...) et les méthodes de traitement qui leur sont associées. Sont ensuite abordés le raisonnement logique et l'intelligence artificielle. Le dernier chapitre propose des énigmes et leurs solutions.

François LURÇAT. — **Le chaos.** — Que sais-je?, vol. 3434 — Un vol. broché, 11,5×17,5, de 127 p. — ISBN 2-13-049629-6. — Prix: FF 42.00. — Presses universitaires de France, Paris, 1999.

Chaos: le mot est évocateur, mais les domaines scientifiques qu'il désigne restent mal connus du public. Grisés par le succès de la physique mathématique, les successeurs de Newton avaient cru que l'on atteindrait une connaissance exacte et totale de l'univers. Poincaré et les autres pionniers du chaos nous ont rendus plus modestes, même si le chaos aide aussi à comprendre des phénomènes très variés que ce livre décrit en ne présupposant aucune connaissance mathématique et en proposant des réflexions philosophiques.

B.H. MATZAT, G.-M. GREUEL, G. HISS, (Editors). — **Algorithmic algebra and number theory.** — Selected papers from a Conference held at the University of Heidelberg in October 1997. — Un vol. broché, 15,5×23,5, de VIII, 434 p. — ISBN 3-540-64670-1. — Prix: DM 129.00. — Springer, Berlin, 1999.

This book contains 22 lectures presented at the final conference of the German research program "Algorithmic Number Theory and Algebra 1991-1997", sponsored by the Deutsche Forschungsgemeinschaft. The purpose of this research program and the meeting was to bring together developers of computer algebra software and researchers using computational methods to gain insight into experimental problems and theoretical questions in algebra and number theory. The book gives an overview on algorithmic methods and results obtained during this period mainly in algebraic number theory, commutative algebra and algebraic geometry, and group and representation theory.

Pierre MEUNIER. — **Agrégation interne de mathématiques: exercices d'oral corrigés et commentés, 3.** — Mathématiques. — Un vol. broché, 15×22, de 334 p. — ISBN 2-13-049636-9. — Prix: FF 218.00. — Presses universitaires de France, Paris, 1998.

Cet ouvrage à l'usage des candidats à l'agrégation interne de mathématiques, mais aussi des élèves de spéciales MP, MP*, PSI*, est constitué de dix chapitres thématiques: quatre d'algèbre, six d'analyse; il complète et achève les deux ouvrages du même auteur parus dans la même collection de la série des exercices d'oral proposés aux grands concours nationaux: X, Mines-Ponts, Centrale-Paris, ENSAE..., ainsi qu'à l'agrégation interne de mathématiques. Les énoncés proviennent, le plus souvent, de sujets proposés à l'oral des concours d'entrée aux grandes écoles.

Victor P. SNAITH. — **Groups, rings and Galois theory.** — Un vol. relié, 15,5×22,5, de VIII, 160 p. — ISBN 981-02-3508-9. — World Scientific, Singapore, 1998.

This book is ideally suited for a two-term undergraduate algebra course culminating in a discussion on Galois theory. It provides an introduction to group theory and to ring theory en route. In addition, there is a chapter on groups — including applications to error-correcting codes and to solving Rubik's cube — which is suitable for a one-term course. The book's concise style will foster student-instructor discussion, as will the selection of exercises with various levels of difficulty.

Claude WAGSCHAL. — **Dérivation, intégration.** — Collection Méthodes. — Un vol. broché, 15×22, de VII, 471 p. — ISBN 2-7056-6376-2. — Prix: FF 220.00. — Hermann, Paris,1999.

Cet ouvrage est consacré à l'étude de la dérivation et de l'intégration. L'intégrale de Lebesgue constitue un outil fondamental en analyse car elle permet de définir des espaces (de classes) de fonctions qui sont complets; grâce à la théorie des distributions, il est alors possible de définir un cadre fonctionnel naturel pour l'étude des équations aux dérivées partielles, par exemple. L'ouvrage s'adresse particulièrement aux étudiants de licence et maîtrise; il intéressera également les élèves des écoles d'ingénieurs qui y trouveront les outils utiles à la résolution de nombreux problèmes.

Claude WAGSCHAL. — **Calcul différentiel.** — Collection Livrets d'exercices. — Un vol. broché, 19×13, de 90 p. — ISBN 2-7056-6378-9. — Prix: FF 58.00. — Hermann, Paris, 1999.

Ce livret propose un corrigé des exercices figurant dans le chapitre 1 du livre du même auteur, *Dérivation, intégration.* Certains exercices ont été regroupés pour constituer des exercices plus substantiels, voire des problèmes. Une table de concordance, à la fin de ce livret, permettra au lecteur de retrouver rapidement où se situe le corrigé de chaque exercice du livre. *Matières:* Application différentiable. — Dérivées d'ordre supérieur. — Théorème des fonctions implicites. — Variété.

Claude WAGSCHAL. — **Intégration: exercices et problèmes corrigés.** — Collection Livrets d'exercices. — Un vol. broché, 19×13, de 136 p. — ISBN 2-7056-6377-0. — Prix: FF 58.00. — Hermann, Paris, 1999.

Ce livret propose un corrigé de la plupart des exercices figurant dans le chapitre 2 du livre du même auteur, *Dérivation, intégration.* Certains exercices ont été regroupés pour constituer des exercices plus substantiels, voire des problèmes. Une table de concordance, à la fin de ce livret, permettra au lecteur de retrouver rapidement où se situe le corrigé de chaque exercice du livre. *Matières:* Théorie de la mesure. — Intégrale de Lebesgue. — Intégration vectorielle. — Mesure de Radon. — Produit d'espaces mesurés. — Espaces de Lebesgue. Fonctions absolument continues. — Séries de Fourier. — Transformation de Fourier.

D.A.R. WALLACE. — **Groups, rings and fields.** — Springer undergraduate mathematics series. — Un vol. broché, VIII, 248 p. — ISBN 3-540-76177-2. — Prix: DM 58.00. — Springer, London, 1998.

David Wallace has written a text on modern algebra which is suitable for a first course in the subject given to mathematics undergraduates. It aims to promote a feeling for the evolutionary and historical development of algebra. It assumes some familiarity with complex numbers, matrices and linear algebra which are commonly taught during the first year of an undergraduate course. Each chapter contains examples, exercises and solutions, perfectly suited to aid self-study.

Paul ZEITZ. — **The art and craft of problem solving.** — Un vol. relié, 20×24,5, de XVII, 334 p. — ISBN 0-471-13571-2. — Prix: £19.99. — John Wiley & Sons, Inc., New York, 1999.

This is a book about mathematical problem solving, for college-level novices. The book is divided into two parts. Part I is an overview of problem-solving methodology, and is the core of the book. Part II contains four chapters, that can be read independently of one another, which outline algebra, combinatorics, number theory, and calculus from the problem solver's point of view.

Histoire

Norman L. BIGGS, E. Keith LLOYD, Robin J. WILSON. — **Graph theory: 1736-1936.** — Reprinted with corrections. — Un vol. broché, 16×23,5, de X, 239 p. — ISBN 0-19-853916-9. — Prix: £25.00. — Clarendon Press, Oxford, 1998.

Building on a set of original writings from some of the founders of graph theory, the book traces the historical development of the subject through a linking commentary. The relevant underlying mathematics is also explained, providing an original introduction for students. Appendices give a brief account of developments since 1936, biographical information, and a comprehensive bibliography.

Paul J. NAHIN. — **An imaginary tale: the story of square root of minus one.** — Un vol. relié, 16×24, de XVI, 257 p. — ISBN 0-691-02795-1. — Prix: US$24.95. — Princeton University Press, Princeton, 1998.

In the book, Paul Nahin tells 2000-year-old history of one of mathematics' most elusive numbers, the square root of minus one, also known as i, re-creating the baffling mathematical problems that conjured it up and the colorful characters who tried to solve them. Addressing readers with both a general and scholarly interest in mathematics, the author weaves into this narrative entertaining historical facts, mathematical discussions, and the application of complex numbers and functions to important problems, such as Kepler's laws of planetary motion and ac electrical circuits. This book can be read as an engaging history, almost a biography, of one of the most evasive and pervasive "numbers" in all mathematics.

Logique et fondements

Xavier CAICEDO, Carlos H. MONTENEGRO, (Editors). — **Models, algebras, and proofs.** — Selected papers of the X Latin American symposium on mathematical logic held in Bogotá. — Lecture notes in pure and applied mathematics, vol. 203. — Un vol. broché, 17,5×25,5, de XIII, 448 p. — ISBN 0-8247-1970-0. — Prix: US$165.00. — Marcel Dekker, Inc., New York, 1999.

Featuring original research and timely surveys by over 30 known experts worldwide, this book provides a thorough discussion of generic and end extensions of models of set theory...

relations between combinatorics and choice principles... model theory beyond first order-applications to stability in Banach spaces, well-founded and non-well-founded inductive definitions, and algorithmic complexity theory... general properties of algebraizable logics... geometric aspects of Lukasiewicz logics... logic of algebraic specification of software... the strength of various proof system... new logical paradigms brought forth by advances in artificial intelligence... etc.

Yu. L. ERSHOV, S.S. GONCHAROV, A. NERODE, J.B. REMMEL, (Editors), V.W. MAREK, (Associate editor). — **Handbook of recursive mathematics, Vol. 1: Recursive model theory.** — Studies in logic and the foundations of mathematics, vol. 138. — Un vol. relié, 15,5×23, de XLV, 620 p. — ISBN 0-444-50003-0. — Prix: Dfl. 225.00. — North-Holland, Amsterdam, 1998.

Contents: Introduction to the Handbook of Recursive Mathematics (Yu.L. Ershov, S.S. Goncharov, A. Nerode, J.B. Remmel). Pure computable model theory (V.S. Harizanov). Elementary theories and their constructive models (Yu.L. Ershov, S.S. Goncharov). Isomorphic recursive structures (C.J. Ash). Computable classes of constructive models (V.P. Dobritsa). Σ-definability of algebraic structures (Yu.L. Ershov). Autostable models and algorithmic dimensions (S.S. Goncharov). Degrees of models (J.F. Knight). Groups of computable automorphisms (A.S. Morozov). Constructive models of finitely axiomatizable theories (M.G. Peretyat'kin). Complexity theoretic model theory and algebra (D.Cenzer, J.B. Remmel). A bibliography of recursive algebra and recursive model theory (I. Kalantari). A bibliography of recursive analysis and recursive topology (V. Brattka, I. Kalantari).

Yu. L. ERSHOV, S.S. GONCHAROV, A. NERODE, J.B. REMMEL, (Editors), V.W. MAREK (Associate editor). — **Handbook of recursive mathematics, Vol. 2: Recursive algebra, analysis and combinatorics.** — Studies in logic and the foundations of mathematics, vol. 139. — Un vol. relié, de 15,5×23, de XLV, 623-1372 p. — ISBN 0-444-50106-1, (set, vol. 1 & 2, 0-444-50107-X). — Prix: Dfl. 275.00 (set, vol. 1 & 2, Dfl. 450.00). — North-Holland, Amsterdam, 1998.

Contents: Π^0_1 classes in mathematics (D. Cenzer, J.B. Remmel). Computability theory and linear orderings (R.G. Downey). Computable algebras and closure systems: coding properties (R.G. Downey, J.B. Remmel). A survey of recursive combinatorics (W. Gasarch). Constructive Abelian groups (N.G. Khisamiev). Recursive and on-line graph coloring (H.A. Kierstead). Polynominal-time computability in analysis (K. Ko). Generally constructive Boolean algebras (S.P. Odintsov). Reverse algebra (S.G. Simpson, J. Rao).

Peter FLETCHER. — **Truth, proof and infinity: a theory of constructions and constructive reasoning.** — Synthese library: studies in epistemology, logic, methodology, and philosophy of science, vol. 276. — Un vol. relié, 17×25, de IX, 469 p. — ISBN 0-7923-5262-9. — Prix: Dfl. 290.00. — Kluwer Academic Publishers, Dordrecht, 1998.

Constructive mathematics is based on the thesis that the meaning of a mathematical formula is given, not by its truth-conditions, but in terms of what constructions count as a proof of it. However, the meaning of the terms "construction" and "proof" has never been adequately explained. This monograph develops precise definitions of construction and proof, and describes the algorithmic substructure underlying intuitionistic logic. Interpretations of Heyting arithmetic and constructive analysis are given. The philosophical basis of constructivism is explored thoroughly in Part I. The author seeks to answer objections from platonists and to reconcile his position with the central insights of Hilbert's formalism and logic.

Martin GOLDSTEN, Haim JUDAH. — **The incompleteness phenomenon: a new course in mathematical logic.** — Un vol. broché, 15,5×23, de XIII, 247 p. — ISBN 1-56881-093-8. — Prix: US$39.00. — A.K. Peters, Natick, Massachusetts, 1998.

What is "the truth"? In our continual striving for precision and order, we have often relied on mathematics to provide us with the answer to this long-standing question. The basic phenomenon of mathematical logic is that every reasonable mathematical system is intrinsically incomplete; there will always be mathematical problems that we cannot solve. This premise is the result of Gödel's well-known incompleteness theorem, and it is the main paradigm of this book. To supplement the concepts explored, the authors have provided exercises at the end of each section.

Robert GOLDBLATT. — **Lectures on the hyperreals: an introduction to nonstandard analysis.** — Graduate texts in mathematics, vol. 188. — Un vol. relié, 16×24, de XIV, 287 p. — ISBN 0-387-98464-X. — Prix: DM 98.00. — Springer, New York, 1998

This is an introduction to nonstandard analysis based on a course of lectures given by the author. It presents nonstandard analysis not just as a theory about infinitely small and large numbers but as a radically different way of viewing many standard mathematical concepts and constructions; a source of new ideas, objects and proofs, and a wellspring of powerful new principles of reasoning (transfer, overflow, saturation, enlargement, hyperfinite approximation, etc.). Features of the text include an early introduction of the ideas of internal, external, and hyperfinite sets, and a set-theoretic approach to enlargement more axiomatic than the usual one based on superstructures.

Giovanni SAMBIN, Jan M. SMITH, (Editors). — **Twenty-five years of constructive type theory.** — Proceedings of a Congress held in Venice, October 1995. — Oxford logic guides, vol. 36. — Un vol. relié, 16×24, de VII, 283 p. — ISBN 0-19-850127-7. — Prix: £60.00. — Clarendon Press, Oxford, 1998.

Martin-Löf type theory is both an important and practical formalization and a focus for a charismatic view of the foundations of mathematics. Per Martin-Löf's work has been of huge significance in the fields of logic and the foundations of mathematics, and has important applications in areas such as computing science and linguistics. This volume celebrates the twenty-fifth anniversary of the birth of the subject. Also published for the first time is one of Per Martin-Löf's earliest papers. *Contents:* Yet another constructivization of classical logic. — Extension of Martin-Löf's type theory with record types. — Type-theoretical checking and philosophy of mathematics. — The Hahn-Banach theorem in type theory. — A realizability interpretation of Martin-Löf's type theory. — The groupoid interpretation of type theory. — An intuitionistic theory of types. — Analytic program derivation in type theory. — About storage operators. — On universes in type theory. — How to believe a machine-checked proof. — Building up a toolbox for Martin-Löf's type theory: subset theory. — An introduction to well-ordering proofs in Martin-Löf's type theory. — Variable-free formalization of the Curry-Howard theory. — The forget-restore principle: a paradigmatic example.

Arturo SANGALLI. — **The importance of being fuzzy: and other insights from the border between math and computers.** — Un vol. relié, 16,5×24, de XVI, 173 p. — ISBN 0-691-00144-8. — Prix: US$24.95. — Princeton University Press, Princeton, 1998.

In this book, the author explains the uses of fuzzy logic, a technique allowing computers the luxury of imprecision and releasing them from the bonds of the absolute. By using fuzzy logic and related concepts, programmers have been able to sidestep the traditional and often

cumbersome search for perfect mathematical solutions to embrace instead solutions which are "good enough". Computers have brought new practicality to mathematics and mathematical applications, and if mathematicians want their work to be relevant to the problems of the modern world they must increasingly recognize "the importance of being fuzzy", Sangalli warns.

Analyse combinatoire

Daniel BENEST, Claude FORESCHLÉ, (Editors). — **Analysis and modelling of discrete dynamical systems.** — Advances in discrete mathematics and applications, vol. 1. — Un vol. relié, 16×23,5, de x, 319 p. — ISBN 90-5699-625-8. — Prix: £45.00. — Gordon and Breach Science Publishers, Amsterdam, distributed by Marston Book Services, Abingdon, Oxon, U.K., 1998.

The theory of discrete dynamical systems, or mappings, has important applications in a number of domains of modern physics, including celestial mechanics and fluid mechanics. This volume provides a comprehensive introduction to the general study of mappings, with particular emphasis on their applications to the dynamics of the solar system. Featuring chapters based on lectures delivered by a panel of international experts at the School on Discrete Dynamical Systems (February 1996, Aussois, France), this book offers graduate students and reseachers in the field a single source for information that, until now, has been available only in widely dispersed journal articles.

Stephen B. MAURER, Anthony RALSTON. — **Discrete algorithmic mathematics.** — Second edition. — Un vol. relié, 19×24, de XIX, 884 p. — ISBN 1-56881-091-1. — Prix: US$59.00. — A.K. Peters, Natick, Massachussets, 1998.

Written in a clear and lively style, the book's emphasis is on themes and ideas, making it coherent and extensive. Special features include: extensive and detailed study of algorithms, emphasis on the recursive and inductive paradigms, thorough coverage of topics like difference equations, probability, and logic, a large number of problems with a hints and answers section and a complete index.

Bruce E. SAGAN, Richard P. STANLEY, (Editors). — **Mathematical essays in honor of Gian-Carlo Rota.** — Progress in mathematics, vol. 161. — Un vol. relié, 16×24, de IX, 463 p. — ISBN 3-7643-3872-5. — Prix: SFr. 148.00. — Birkhäuser, Boston, 1998.

The mathematical essays in this volume pay tribute to Gian-Carlo Rota on the occasion of his 64th birthday. The breadth and depth of Rota's interests, research, and influence are reflected in such areas as combinatorics, invariant theory, geometry, algebraic topology, representation theory, and umbral calculus, the latter being the subject of a paper coauthored by Rota himself. Other important areas of research that are touched in this outstanding collection include special functions, commutative algebra, and statistics.

Richard P. STANLEY. — **Enumerative combinatorics, vol. 2.** — Cambridge studies in advanced mathematics, vol. 62. — Un vol. relié, 16×23,5, de XII, 581 p. — ISBN 0-521-56069-1. — Prix: £45.00. — Cambridge University Press, Cambridge, 1999.

This volume covers the composition of generating functions, trees, algebraic generating functions, *D*-finite generating functions, noncommutative generating functions, and symmetric functions. The chapter on symmetric functions provides the only available treatment of this subject suitable for an introductory graduate course and focusing on combinatorics, especially

the Robinson-Schensted-Knuth algorithm. Also covered are connections between symmetric functions and representation theory. An appendix (written by Sergey Fomin) covers some deeper aspects of symmetric function theory, including jeu de taquin and the Littlewood-Richardson rule.

Ordre, treillis

George GRÄTZER. — **General lattice theory.** — 2nd ed. — Un vol. relié, 17,5×24, de XIX, 663 p. — ISBN 3-7643-5239-6. — Prix: SFr. 198.00. — Birkhäuser Verlag, Basel, 1998.

The core of *General Lattice Theory* combines the advantages of an introductory text with those of a monograph to introduce the general reader to lattice theory and to bring the expert up to date on the most recent developments. In this present edition, the work has been significantly updated and expanded. It contains an extensive new bibliography of 530 items and has been supplemented by eight appendices authored by an exceptional group of experts. The first appendix, written by the author, briefly reviews developments in lattice theory, specifically, the major results of the last 20 years and solutions of the problems proposed in the first edition.

Théorie des nombres

Rolf BERNDT, Ralf SCHMIDT. — **Elements of the representation theory of the Jacobi group.** — Progress in mathematics, vol. 163. — Un vol. relié, 16×24, de XIII, 213 p. — ISBN 3-7643-5922-6. — Prix: SFr. 88.00. — Birkhäuser Verlag, Basel, 1998.

The Jacobi group is a semidirect product of a symplectic group with a Heisenberg group. This text gathers for the first time from the representation theory of this group in both local (archimedean and non-archimedean) cases and in the global number field case. Via a bridge to Waldpurger's theory for the metaplectic group, complete classification theorems for irreducible representations are obtained. Further topics include differential operators, Whittaker models, Hecke operators, spherical representations and theta functions. The global theory is aimed at the correspondence between automorphic representations and Jacobi forms.

John H. CONWAY, Richard K. GUY. — **Le livre des nombres.** — Un vol. broché, 15,5×24, de VII, 310 p. — ISBN 2-212-03638-8. — Prix: FF 189.00. — Eyrolles, Paris, 1998.

Le livre des nombres est une source qui aborde le nombre sous ses différents aspects. — Le nombre et les langues: Comment les langues ont-elles créé le mot associé à un nombre? Quels sont les mots qui en dérivent? — Le comptage des nombres: Comment, par des arrangements appropriés, les mathématiciens ont-ils trouvé des relations entre des nombres dont les applications sont d'une incroyable variété? — La description des familles de nombres: L'inventivité des hommes est sans limite et l'on découvre comment et pourquoi ces familles se sont multipliées et continuent à se développer. Ce livre très complet, montre aussi la force de la géométrie dans la découverte de propriétés arithmétiques et algébriques. Cet ouvrage est accessible aux lecteurs non mathématiciens.

Dinakar RAMAKRISHNAN, Robert J. VALENZA. — **Fourier analysis on number fields.** — Graduate texts in mathematics, vol. 186. — Un vol. relié, 16×24, de XXI, 350 p. — ISBN 0-387-98436-4. — Prix: DM 79.00. — Springer, New York, 1999.

The general aim of this book is to provide a modern approach to number theory through a blending of complementary algebraic and analytic perspectives, emphasizing harmonic analysis on topological groups. The more particular goal is to cover John Tate's visionary thesis, giving

virtually all the necessary analytic details and topological preliminaries — technical prerequisites that are often foreign to the typical, more algebraically inclined number theorist. Specific topics include: topological groups, representation theory, duality for locally compact abelian groups, the structure of arithmetic fields, adeles and ideles, an introduction to class field theory, and Tate's thesis and applications.

A.J. SCHOLL, R.L. TAYLOR, (Editors). — **Galois representations in arithmetic algebraic geometry.** — London Mathematical Society lecture note series, vol. 254. — Un vol. broché, 15×23, de 493 p. — ISBN 0-521-64419-4. — Prix: £29.95. — Cambridge University Press, Cambridge, 1998.

This book is a conference proceedings based on a 1996 Durham Symposium. The title was interpreted loosely and the symposium covered recent developments on the interface between algebraic number theory and arithmetic algebraic geometry. Some articles are expositions of subjects which have received substantial recent attention: Erez on geometric trends in Galois module theory, Mazur on rational points on curves and varieties, Moonen on Shimura varieties in mixed characteristic, Rubin and Scholl on the work of Kato on the Birch-Swinnerton-Dyer conjecture, and Schneider on rigid geometry. Some are research papers: Coleman and Mazur, Goncharov, Gross, and Serre.

Nigel P. SMART. — **The algorithmic resolution of diophantine equations.** — London Mathematical Society student texts, vol. 41. — Un vol. broché, 15×23, de XVI, 243 p. — ISBN 0-521-64633-2. — Prix: £16.95 (relié: £45.00). — Cambridge University Press, Cambridge, 1998.

Beginning with a brief introduction to algorithms and diophantine equations, this volume aims to provide a coherent modern account of the methods used to find all the solutions to certain diophantine equations, particularly those procedures which have been developed for use on a computer. The study is divided into three parts, the emphasis throughout being on examining approaches with a wide range of applications. The first section considers basic techniques, including local methods, sieving, descent arguments and the LLL-algorithm. The second section explores problems which can be solved using Baker's theory of linear forms in logarithms. The final section looks at problems associated with curves, mainly focusing on rational and integral points on elliptic curves. Each chapter concludes with a useful set of exercises. A detailed bibliography is included.

David WELLS. — **Le dictionnaire Penguin des nombres curieux.** — Deuxième édition. — Un vol. broché, 15,5×24, de 270 p. — ISBN 2-212-03641-8 — Prix: FF 98.00. — Eyrolles, Paris, 1998.

Cette deuxième édition du *Dictionnaire Penguin des nombres curieux* a été entièrement revue et corrigée, augmentée et actualisée des découvertes les plus récentes: validité du théorème de Fermat, tous les nombres premiers records découverts depuis la précédente édition, nouvelles formes de coopération sur Internet, etc. Ceci porte le nombre d'entrées à 700, dont 174 nouvelles et 250 compléments aux entrées existantes.

Cem Y. YILDIRIM, Serguei A. STEPANOV, (Editors). — **Number theory and its applications.** — Proceedings of a Summer School at Bilkent University. — Lecture notes in pure and applied mathematics, vol. 204. — Un vol. broché, 17,5×25,5, de XIII, 343 p. — ISBN 0-8247-1969-7. — Prix: US$ 150.00. — Marcel Dekker, Inc., New York, 1999.

This book provides up-to-date surveys on modular forms and Hecke operators, exponential sums, and sieve methods with applications to additive and multiplicative number theory, for example, the ideas behind the recent surprising proof that there are infinitely many primes of the form a^2+b^4 are laid out... contains numerous results on character sums and finite fields

with applications to coding theory... covers classical and new material on algebraic numbers, transcendence theory, and diophantine approximation, including the recent proof of algebraic independence of the numbers p, e^p, $G(1/4)$... dwells on the connections between the distribution of primes and the Riemann zeta-function... etc.

Géométrie algébrique

C.G. GIBSON. — **Elementary geometry of algebraic curves: an undergraduate introduction.** — Un vol. broché, 15,5×23, de XVI, 250 p. — ISBN 0-521-64641-3. — Prix: £15.95 (relié: £42.50). — Cambridge University Press, Cambridge, 1998.

This is an introduction to plane algebraic curves from a geometric viewpoint. The book is well illustrated, and contains several hundred worked examples and exercises. From the familiar lines and conics of elementary geometry the reader proceeds to general curves in the real affine plane, with excursions to more general fields to illustrate applications, such as number theory. By adding points at infinity the affine plane is extended to the projective plane, yielding a natural setting for curves and providing a flood of illumination into the underlying geometry. A minimal amount of algebra leads to the famous theorem of Bézout, whilst the ideas of linear systems are used to discuss the classical group structure on the cubic.

Juan C. MIGLIORE. — **Introduction to liaison theory and deficiency modules.** — Progress in mathematics, vol. 165. — Un vol. relié, 16×24, de XII, 215 p. — ISBN 0-8176-4027-4. — Prix: SFr. 88.00. — Birkhäuser, Boston, 1998.

This book carefully examines liaison theory and deficiency modules from basic principles, taking a geometric approach to the subject. The focus is on the role of deficiency modules in algebraic geometry, particularly with respect to liaison theory, which is treated here both as a subject in itself and as a tool. The structure and classification of liaison classes are explored, and a variety of ways are described in which liaison has been applied to geometric questions. The classical study of liaison via complete intersections is compared and contrasted with the relatively new study of the subject via arithmetic Gorenstein ideals.

Algèbre linéaire et multilinéaire, théorie des matrices

Albrecht BÖTTCHER, Bernd SILBERMANN. — **Introduction to large truncated Toeplitz matrices.** — Universitext. — Un vol. relié, 16,5×24, de XI, 258 p. — ISBN 0-387-98570-0. — Prix: DM 98.00. — Springer, New York, 1999.

This is a text on the application of functional analysis and operator theory to some concrete asymptotic problems of linear algebra. The book contains results on the stability of projection methods, deals with asymptotic inverses and Moore-Penrose inversion of large Toeplitz matrices, and embarks on the asymptotic behavior of the norms of inverses, the pseudospectra, the singular values, and the eigenvalues of large Toeplitz matrices. The approach is heavily based on Banach algebra techniques and nicely demonstrates the usefulness of C*-algebras and local principles in numerical analysis.

Anneaux et algèbres

J. ELIAS, J.M. GIRAL, R.M. MIRÓ-ROIG, S. ZARZUELA, (Editors). — **Six lectures on commutative algebra.** — Progress in mathematics, vol. 166. — Un vol. relié, 16,5×24, de IX, 398 p. — ISBN 3-7643-5951-X. — Prix: SFr. 108.00. — Birkhäuser Verlag, Basel, 1998.

Interest in commutative algebra has surged over the past decades. In order to survey and highlight recent developments in this rapidly expanding field, the Centre de Recerca Matema-

tica in Bellaterra organized the Summer School on Commutative Algebra 1996 which was held from July 16 to 26, 1996. *Contents:* Luchezar L. Avramov: Infinite free resolutions. — Mark L. Green: Generetic initial ideals. — Craig Huneke: Tight closure, parameter ideals, and geometry. — Peter Schenzel: On the use of local cohomology in algebra and geometry. — Giuseppe Valla: Problems and results on Hilbert functions of graded algebras. — Wolmer V. Vasconcelos: Cohomological degrees of graded modules.

Stephen DONKIN. — **The q-Schur algebra.** — London Mathematical Society lecture note series, vol. 253. — Un vol. broché, 15×23, de x, 179 p. — ISBN 0-521-64558-1. — Prix: £24.95. — Cambridge University Press, Cambridge, 1998.

This book focusses on the representation theory of q-Schur algebras and connections with the representation theory of Hecke algebras and quantum general linear groups. The aim is to present, from a unified point of view, quantum analogues of certain results known already in the classical case. The approach is largely homological, based on Kempf's vanishing theorem for quantum groups and the quasihereditary structure of the q-Schur algebras.

Alberto FACCHINI. — **Module theory: endomorphism rings and direct sum decompositions in some classes of modules.** — Progress in mathematics, vol. 167. — Un vol. relié, 16,5×24, de XIII, 285 p. — ISBN 3-7643-5908-0. — Prix: SFr. 118.00. — Birkhäuser Verlag, Basel, 1998.

The purpose in writing this expository monograph has been three-fold. First, the author set out to present the solution of a problem posed by Wolfgang Krull in 1932. He asked whether what is now called the "Krull-Schmidt theorem" holds for artinian modules. Second, the author presents the answer to a question posed by Warfield in 1975, namely, whether the Krull-Schmidt-Theorem holds for serial modules. The solution to the Warfield problem shows an interesting behavior; in fact, it is a phenomenon so rare in the history of Krull-Schmidt type theorems that its presentation to a wider mathematical audience provides the third incentive for this monograph.

T.Y. LAM. — **Lectures on modules and rings.** — Graduate texts in mathematics, vol. 189. — Un vol. relié, 16×24, de XXI, 557 p. — ISBN 0-387-98428-3. — Prix: DM 119.00. — Springer, New York, 1999.

This book provides a new alternative introduction to the theory of modules and rings that is largely independent of the author's earlier graduate text, *A first course in noncommutative rings* (GTM 131). This text is ideally suited for use in graduate courses and seminars. Focusing on some of the most central topics in modules and rings, the author efficiently introduces the reader to a wealth of basic and useful ideas without the hindrance of heavy machinery or undue abstractions. Topics covered include free, projective, injective, and flat modules, homological and uniform dimensions, finiteness conditions, Ore localization, nonsingular rings and Goldie's theorems, maximal and Martindale rings of quotients, Frobenius and quasi-Frobenius rings, and the classical Morita theory of module category equivalences and dualities.

Paul C. ROBERTS. — **Multiplicities and Chern classes in local algebra.** — Cambridge tracts in mathematics, vol. 133. — Un vol. relié, 16×23,5, de XI, 303 p. — ISBN 0-521-47316-0. — Prix: £37.50. — Cambridge University Press, Cambridge, 1998.

This book gives a detailed account of recent work on relations between commutative algebra and intersection theory, with a particular emphasis on applications of the theory of local Chern characters. This theory is the result of many years of development, having originated in

topology and been introduced in algebraic geometry about thirty years ago. Building on the algebraic form described in *Intersection Theory* by W. Fulton, Paul Roberts presents further developments and important algebraic applications that were not known at the time Fulton's book was written. Some of these applications come from the author's own work.

Askar A. TUGANBAEV. — **Semidistributive modules and rings.** — Mathematics and its applications, vol. 449. — Un vol. relié, 17×25, de x, 352 p. — ISBN 0-7923-5209-2. — Prix: Dfl. 290.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This is the first monograph on the theory of semidistributive modules and rings. It investigates such topics as the relationship between semidistributive modules and flat, projective, injective, multiplication, as well as Bézout modules. The volume concludes with an extensive bibliography. It can be recommended as an introduction to structural and homological ring theory, and will prove useful for postgraduates and researchers specialising in algebra.

Catégories, algèbre homologique, cohomologie des groupes

David M. CLARK, Brian A. DAVEY. — **Natural dualities for the working algebraist.** — Cambrige studies in advanced mathematics, vol. 57. — Un vol. relié, 16×23,5, de XII, 356 p. — ISBN 0-521-45415-8. — Prix: £40.00. — Cambridge University Press, Cambridge, 1998.

The theory of natural dualities, as presented in this text, is broad enough to encompass many known dualities through a rich assortment of substantive theorems yet concrete enough to be used to generate an array of previously undiscovered dualities. This text will serve as a user manual for algebraists, for category theorists and for those who use algebra in their work, particularly mathematicians and computer scientists interested in non-classical logics. As the first text devoted to the theory of natural dualities, it provides an efficient path through a large body of results, examples and applications in this subject which is otherwise available only in scattered research papers.

Théorie des groupes et généralisations

C.M. CAMPBELL, E.F. ROBERTSON, N. RUSKUC, G.C. SMITH, (Editors). — **Groups St Andrews 1997 in Bath, I and II.** — London Mathematical Society lecture note series, vol. 260, 261. — Deux vol. brochés, 15,5×23, de x, 737 p. pour l'ensemble. — ISBN 0-521-65588-9 (vol. 1), 0-521-65576-5 (vol. 2). — Prix: £29.95 (vol. 1), £29.95 (vol. 2). — Cambridge University Press, Cambridge, 1999.

This two-volume book contains selected papers from the international conference "Groups St Andrews 1997 in Bath". The articles are arranged in roughly alphabetical order and cover a wide spectrum of modern group theory. There are articles based on lecture courses given by five main speakers together with refereed survey and research articles contributed by other conference participants. Proceedings of earlier "Groups St Andrews" conferences have had a major impact on the development of group theory and these volumes should be equally important.

Peter J. CAMERON. — **Permutation groups.** — London Mathematical Society student texts, vol. 45. — Un vol. broché, 15×23, de x, 220 p. — ISBN 0-521-65378-9. — Prix: £15.95 (relié: £42.50). — Cambridge University Press, Cambridge, 1999.

Permutation groups are one of the oldest topics in algebra. Their study has recently been revolutionised by new developments, particularly the classification of finite simple groups, but also relations with logic and combinatorics, and importantly, computer algebra systems have

been introduced that can deal with large permutation groups. This book gives a summary of these developments, including an introduction to relevant computer algebra systems, sketch proofs of major theorems, and many examples of applying the classification of finite simple groups.

R.W. CARTER, J. SAXL. (Editors). — **Algebraic groups and their representations.** — NATO ASI Series. Series C: Mathematical and physical sciences, vol. 517. — Un vol. relié, 17×24,5, de XVIII, 374 p. — ISBN 0-7923-5251-3. — Prix: Dfl. 320.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume contains 19 articles written by speakers at the Advanced Study Institute on "Modular representations and subgroup structure of algebraic groups and related finite groups" held at the Isaac Newton Institute, Cambridge, from 23rd June to 4th July 1997. Articles on representation theory are written by Andersen on tilting modules, Carter on canonical bases, Cline, Parshall and Scott on endomorphism algebras, James and Kieschev on the symmetric group, Littelmann on the path model, Lusztig on homology bases, McNinch on semisimplicity in prime characteristic, Robinson on block theory, Scott on Lusztig's character formula, and Tanisaki on highest weight modules. Articles on subgroup structure are written by Setz and Brundan on double cosets, Liebeck on exceptional groups, Saxl on subgroups containing special elements, and Guralnick on applications of subgroup structure. Steinberg gives a new, short proof of the isomorphism and isogeny theorems for reductive groups. Aschbaker discusses the classification of quasithin groups and Borovik the classification of finite Morley rank.

Dikran DIKRANJAN, Luigi SALCE, (Editors). — **Abelian groups, module theory, and topology.** — Proceedings in honor of Adalberto Orsatt's 60th bithday. — Lecture notes in pure and applied mathematics, vol. 201. — Un vol. broché, 17,5×25,5, de XV, 444 p. — ISBN 0-8247-1937-9. — Prix: US$165.00. — Marcel Dekker, Inc., New York, 1998.

This book investigates currently popular topics in abelian group theory and provides a solution to a long-standing problem on automorphisms of p-groups... studies endomorphism rings and automorphism groups of torsion-free modules over PIDs and valuation domains... highlights dualities between the categories of abstract and topological modules, and analyzes self-dual locally compact abelian groups... investigates modules related to equivalences and dualities... explores various classes of rings and commutative rings with Acc for irreducible ideals... provides new structural results for valuation and Prüfer domains, as well as a technique to build Noetherian domains inside an ideal-adic completion... elucidates applications of Roelke uniformity in the study of the unitary groups of Hilbert spaces... etc.

Lino di MARTINO, William M. KANTOR, Guglielmo LUNARDON, Antonio PASINI, Maria Clara TAMBURINI, (Editors). — **Groups and geometries.** — Siena Conference, September 1996. — Trends in mathematics. — Un vol. relié, 17×24, de XII, 261 p. — ISBN 3-7643-5881-5. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1998.

In this book, special attention was drawn to the interplay between group-theoretic methods and geometric and combinatorial ones. Expanded versions of many of the talks appear in these proceedings. Algebraists and geometers will encounter in this conference record a stimulating collection of ideas stemming from work in such areas as 1) the classification of finite simple groups; 2) the structure and properties of groups of Lie type over finite and algebraically closed fields of finite characteristic; 3) buildings, and the geometry of projective and polar spaces; and 4) geometries of sporadic simple groups.

Groupes topologiques; groupes et algèbres de Lie

Neil HINDMAN, Dona STRAUSS. — **Algebra in the Stone-Čech compactification: theory and applications.** — De Gruyter expositions in mathematics, vol. 27. — Un vol. relié, 17,5×24,5, de XIII, 485 p. — ISBN 3-11-015420-X. — Prix: DM 258.00. — Walter de Gruyter, Berlin, 1998.

A study of the algebraic properties of compact right topological semigroups in general and the Stone-Čech compactification of a discrete semigroup in particular. Several powerful applications to combinatorics, primarily to the branch of combinatorics known as Ramsey theory, are given. Connections with topological dynamics and ergodic theory are also presented. The text is essentially self-contained and does not require any prior mathematical expertise beyond a knowledge of the basic concepts of algebra, analysis, and topology standardly covered in the first year of graduate school. Most of the material presented is based on results that have been available in research journals.

Karl H. HOFMANN, Sidney A. MORRIS. — **The structure of compact groups: a primer for the student, a handbook for the expert.** — De Gruyter studies in mathematics, vol. 25. — Un vol. relié, 17,5×24,5, de XVII, 833 p. — ISBN 3-11-015268-1. — Prix: DM 278.00. — Walter de Gruyter, Berlin, 1998.

The theme of this book is the *structure theory* of compact groups. It contains a completely self-contained introduction to linear Lie groups and a substantial body of material on compact Lie groups. The authors' approach is distinctive in so far as they define a linear Lie group as a particular subgroup of the multiplicative group of a Banach algebra. Compact Lie groups are recognized at an early stage as being linear Lie groups. This approach avoids the use of machinery on manifolds. The text is written in a style to make it accessible to the beginning graduate student with a basic knowledge in analysis, algebra, and topology.

Elemér E. ROSINGER. — **Parametric Lie group actions on global generalised solutions of nonlinear PDEs: including a solution to Hilbert's fifth problem.** — Mathematics and its applications, vol. 452. — Un vol. relié, 17×25, de XVII, 234 p. — ISBN 0-7923-5232-7. — Prix: Dfl. 195.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book presents global actions of arbitrary Lie groups on large classes of generalised functions by using a novel parametric approach. This new method extends and completes earlier results of the author and collaborators, in which global Lie group actions on generalised functions were only defined in the case of projectable or fibre preserving Lie group actions. The parametric method opens the possibility of dealing with vastly larger classes of Lie semigroup actions which still transform solutions into solutions. These Lie semigroups can contain arbitrary noninvertible smooth mappings. Thus, they cannot be subsemigroups of Lie groups.

Xiaoping XU. — **Introduction to vertex operator superalgebras and their modules.** — Mathematics and its applications, vol. 456. — Un vol. relié, 17×25, de XVI, 356 p. — ISBN 0-7923-5242-4. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book presents a systematic study on the structures of vertex operator superalgebras and their modules. Related theories of self-dual codes and lattices are included, as well as recent achievements on classifications of certain simple vertex operator superalgebras and their irreducible twisted modules, constructions of simple vertex operator superalgebras from graded associative algebras and their antié-involutions, self-dual codes and lattices.

Mesure et intégration

Klaus BICHTELER. — **Integration: a functional approach.** — Birkhäuser advanced text. — Un vol. relié, 17×24, de VIII, 193 p. — ISBN 3-7643-5936-6. — Prix: SFr. 68.00. — Birkhäuser Verlag, Basel, 1998.

This book covers Lebesgue integration and its generalizations from Daniell's point of view, modified by the use of seminorms. Integrating functions rather than measuring sets is posited as the main purpose of measure theory. From this point of view Lebesgue's integral can be had as a rather straightforward, even simplistic, extension of Riemann's integral; and its aims, definitions, and procedures can be motivated at an elementary level.

Paul KRÉE. — **Intégration et théorie de la mesure: une approche géométrique.** — Mathématiques pour le 2e cycle. — Un vol. broché, 17,5×26, de X, 211 p. — ISBN 2-7298-6718-X. — Prix: FF 140.00. — Ellipses, Paris, 1997.

La collection *Mathématiques 2e cycle* se propose de mettre à la disposition des étudiants de licence et de maîtrise de mathématiques des ouvrages couvrant l'essentiel des programmes actuels des universités françaises. Les auteurs ont voulu rendre ces livres accessibles à tous: les sujets traités sont présentés de manière simple et progressive, tout en respectant scrupuleusement la rigueur mathématique. Chaque volume comporte un exposé du cours avec des démonstrations détaillées de tous les résultats essentiels, et de nombreux exercices.

Pertti MATTILA. — **Geometry of sets and measures in Euclidean spaces: fractals and rectifiability.** — Cambridge studies in advanced mathematics, vol. 44. — Un vol. broché, 15,5×23, de XII, 343 p. — ISBN 0-521-65595-1. — Prix: £40.00. — Cambridge University Press, Cambridge, 1999.

The main theme of this book is the study of geometric properties of general sets and measures in Euclidean spaces. Applications of this theory include fractal-type objects such as strange attractors for dynamical systems and those fractals used as models in the sciences. The author provides a firm and unified foundation and develops all the necessary main tools, such as covering theorems, Hausdorff measures and their relations to Riesz capacities and Fourier transforms. The last third of the book is devoted to the Besicovitch-Federer theory of rectifiable sets, which form in a sense the largest class of subsets of Euclidean space possessing many of the properties of smooth surfaces.

C.A. ROGERS. — **Hausdorff measures.** — Cambridge mathematical library. — Un vol. broché, 25×23, de XXX, 195 p. — ISBN 0-521-62491-6. — Prix: £17.95. — Cambridge University Press, Cambridge, 1998.

This new edition has a foreword by Kenneth Falconer outlining the developments in measure theory since this book first appeared. There are three chapters: the first contains an introduction to measure theory, aying particular attention to the study of non-sigma-finite measures, the second develops the most general aspects of the theory of Hausdorff measures and the third gives a general survey of applications of Hausdorff measures followed by detailed accounts of two special applications. Based on lectures given by the author at University College London this book is ideal for graduate mathematicians with no previous knowledge of the subject, but experts in the field will also want a copy for their shelves.

Fonctions de plusieurs variables complexes

M. Salah BAOUENDI, Peter EBENFELT, Linda Preiss ROTHSCHILD. — **Real submanifolds in complex space and their mappings.** — Princeton mathematical series, vol. 47. — Un vol.

relié, 16×24, de XII, 404 p. — ISBN 0-691-00498-6. — Prix: US$69.50. — Princeton University Press, Princeton, 1999.

One of the most important topics the authors address here is the holomorphic extension of functions and mappings which satisfy the tangential Cauchy-Riemann equations on real submanifolds. They present the main results in this area with a novel and self-contained approach. The book devotes considerable attention to the study of holomorphic mappings between real submanifolds, and proves finite determination of such mappings by their jets under some optimal assumptions. The authors also give a thorough comparison of the various nondegeneracy conditions for manifolds and mappings and present new geometric interpretations of these conditions. Throughout the book, Cauchy-Riemann vector fields and their orbits play a central role and are presented in a setting both general and elementary.

Fonctions spéciales

George E. ANDREWS, Richard ASKEY, Ranjan ROY. — **Special functions.** — Encyclopedia of mathematics and its applications, vol. 71. — Un vol. relié, 16×24, de XVI, 664 p. — ISBN 0-521-62321-9. — Prix: £55.00. — Cambridge University Press, Cambridge, 1999.

This treatise presents an overview of special functions, focusing primarily on hypergeometric functions and the associated hypergeometric series, including Bessel functions and classical orthogonal polynomials. The basic building block of the functions studied in this book is the gamma functions. In addition to relatively new work on gamma and beta functions, such as Selberg's multidimensional integrals, a number of important but relatively unknown nineteenth century results are included. The authors discuss Wilson's beta integral and the associated orthogonal polynomials. Some q-extensions of beta integrals and hypergeometric series are presented with Bailey chains employed to derive some results. An introduction to spherical harmonics and applications of special functions to combinatorial problems are included. The book also deals with finite field versions of some beta integrals.

William B. JONES, A. Sri RANGA, (Editors). — **Orthogonal functions, moment theory, and continued fractions: theory and applications.** — Lecture notes in pure and applied mathematics, vol. 199. — Un vol. broché, 17,5×25,5, de XII, 416 p. — ISBN 0-8247-0207-7. — Prix: US$165.00. — Marcel Dekker, Inc., New York, 1998.

Featuring the insights of nearly 30 contributors, *Orthogonal Functions, Moment Theory, and Continued Fractions* analyzes the asymptotic behavior of continued fraction coefficients for the Binet and gamma functions... details new results on orthogonal Laurent polynomials... computes special functions in the complex domain using continued fractions... uses the Freud conjecture to analyze the coefficients of Stieltjes continued fractions for the first time... presents new results using Szegö polynomials and their application to frequency analysis... develops new results on strong moment theory and orthogonal rational functions using finite Blaschke products... proves that a two-parameter subfamily can subsume a four-parameter family of twin-convergence regions for continued fractions... etc.

Equations différentielles ordinaires

Angelo FAVINI, Atsushi YAGI. — **Degenerate differential equations in Banach spaces.** — Pure and applied mathematics, vol. 215. — Un vol. relié, 16×23,5, de XI, 313 p. — ISBN 0-8247-1677-9. — Prix: US$155.00. — Marcel Dekker Inc., New York, 1998.

This book contains a detailed study of linear abstract degenerate differential equations and the regularity of their relations, using the semigroups generated by multivalued (linear)

operators and extensions of the operational method of Da Prato and Grisvard. It introduces the semigroups of weak type generated by multivalued linear operators for the first time and includes classical results pertaining to linear operators, evolution equations, and interpolation theory. It presents recent results on the regularity of semigroups generated by second order degenerate parabolic operators in various function spaces.

Arkadii Kh. GEILIG, Alexander N. CHURILOV. — **Stability and oscillations of nonlinear pulse-modulated systems.** — Un vol. relié, 16×24, de XVI, 362 p. — ISBN 0-8176-3987-X. — Prix: SFr. 128.00. — Birkhäuser, Boston, 1998.

The mathematical methods for studying stability and oscillations in control systems with various types of pulse modulation (pulse-width, pulse-frequency, combined and phases in different modifications) are treated comprehensively in this new book. The original approaches developed by the authors are of particular interest. They include the averaging methods which enable the reader to extend pulse-modulated systems, to absolute stability theory and the fixed-point approach for study of forced oscillations.

Michael I. GIL'. — **Stability of finite and infinite dimensional systems.** — The Kluwer international series in engineering and computer science. — Un vol. relié, 16×24, de XVIII, 354 p. — ISBN 0-7923-8221-8. — Prix: Dfl. 330.00. — Kluwer Academic Publishers, Boston, 1998.

The aim of the book is to provide new tools for specialists in control system theory, stability theory of ordinary and partial differential equations, and differential-delay equations. This is the first book that gives a systematic exposition of the approach to stability analysis which is based on estimates for matrix-valued and operator-valued functions, allowing us to investigate various classes of finite and infinite dimensional systems from the unified viewpoint. This book contains solutions to the problems connected with the Aizerman and generalized Aizerman conjectures and presents fundamental results by A.Yu. Levin for the stability of nonautonomous systems having variable real characteristic roots.

A.A. MARTYNYUK. — **Stability by Liapunov's matrix function method with applications.** — Pure and applied mathematics, vol. 214. — Un vol. relié, 16×23,5, de X, 276 p. — ISBN 0-8247-0191-7. — Prix: US$150.00. — Marcel Dekker, Inc., New York, 1998.

The book models the stability of actual objects using ordinary differential equations, singularly perturbed systems, and high-dimensional stochastic systems... tests the multistability of motion in large-scale systems using matrix-valued functions...details the classic direct Liapunov method and its variants... compares scalar, vector, and matrix-valued Liapunov functions...proposes a new generalization of the matrix-valued auxiliary function... formulates the criteria of motion stability using special matrices... extends auxiliary functions to make the direct Liapunov method more powerful... etc.

Equations aux dérivées partielles

Joachim ESCHER, Gieri SIMONETT, (Editors). — **Topics in nonlinear analysis: the Herbert Amann anniversary volume.** — Progress in nonlinear differential equations and their applications, vol. 35. — Un vol. relié, 16×24, de IX, 744 p. — ISBN 3-7643-6016-X. — Prix: SFr. 188.00. — Birkhäuser Verlag, Basel, 1999.

Herbert Amann's work is distinguished and marked by great lucidity and deep mathematical understanding. The present collection of 31 research papers reflects his interest and lasting

influence in various fields of analysis such as degree and fixed point theory, nonlinear elliptic boundary value problems, abstract evolutions equations, quasilinear parabolic systems, fluid dynamics, Fourier analysis, and the theory of function spaces. Contributors are A. Ambrosetti, S. Angenent, W. Arendt, M. Badiale, T. Bartsch, Ph. Bénilan, Ph. Clément, E. Fasangova, M. Fila, D.de Figueiredo, K. Gripenberg, G. Da Prato, E.N. Dancer, D. Daners, E. DiBenedetto, D.J. Diller, J. Escher, G.P. Galdi, Y. Giga, T. Hagen, D.D. Hai, M. Hieber, H. Hofer, C. Imbusch, K. Ito, P. Krejči, S.-O. Londen, A. Lunardi, T. Miyakawa, P. Quittner, J. Prüss, V.V. Pukhnachov, P.J. Rabier, P.H. Rabinowitz, M. Renardy, B. Scarpellini, B.J. Schmitt, K. Schmitt, G. Simonett, H. Sohr, V.A. Solonnikov, J. Sprekels, M. Struwe, H. Triebel, W. von Wahl, M. Wiegner, K. Wysocki, E. Zehnder and S. Zheng.

Bengt FORNBERG. — **A practical guide to pseudospectral methods.** — Cambridge monographs on applied and computational mathematics, vol. 1. — Un vol. broché, 15,5×23, de x, 231 p. — ISBN 0-521-64564-6. — Prix: £40.00. — Cambridge University Press, Cambridge, 1999.

During the last two decades, pseudospectral methods have emerged as alternatives to better known computational procedures, such as finite difference and finite element methods of numerical solution. These areas include computational fluid dynamics, wave motion, and weather forecasting. This book explains how, when and why this pseudospectral approach works. In order to make the subject accessible to students as well as researchers and engineers, the subject is presented using illustrations, examples, heuristic explanations, and algorithms rather than rigorous theoretical arguments. A key theme of the book is to establish and exploit the close connection that exists between pseudospectral and finite difference methods.

Paul KOOSIS. — **Introduction to H_p spaces.** — Second edition, corrected and augmented. — With two appendices by V.P. HAVIN. — Cambridge tracts in mathematics, vol. 115. — Un vol. relié, 15,5×23,5, de XIV, 287 p. — ISBN 0-521-45521-9. — Prix: £45.00. — Cambridge University Press, Cambridge, 1999.

The first edition of this well-known book was noted for the clear and accessible exposition of the basic theory of Hardy spaces from the concrete point of view (in the unit circle and the half plane). The intention was to give the reader, assumed to know basic real analysis, a secure foothold in the basic theory, and the ability to understand its applications in other areas. For this reason, emphasis is placed on methods and the ideas behind them rather than on the accumulation of as many results as possible. Computations are done in detail and there are many diagrams. The second edition retains that intention, but the coverage has been extended. The author has included two appendices by V.P. Havin, on Peter Jones' interpolation formula, and Havin's own proof of the weak sequential completeness of $L_1/H_1(0)$.

Systèmes dynamiques et théorie ergodique

Renato FERES. — **Dynamical systems and semisimple groups: an introduction.** — Cambridge tracts in mathematics, vol. 126. — Un vol. relié, 16×23,5, de XVI, 245 p. — ISBN 0-521-59162-7. — Prix: £35.00. — Cambridge University Press, Cambridge, 1998.

This book comprises a systematic, self-contained introduction to the Margulis-Zimmer theory and provides an entry into current research. The author develops in a detailed and self contained way the main results on Lie groups, Lie algebras, and semisimple groups, including basic facts normally covered in first courses on manifolds and Lie groups plus topics such as integration of infinitesimal actions of Lie groups. He then derives the basic structure theorems

for the real semisimple Lie groups, such as the Cartan and Iwasawa decompositions, and gives an extensive exposition of the general facts and concepts from topological dynamics and ergodic theory, including detailed proofs of the multiplicative ergodic theorem and Moore's ergodic theorem.

Jacek GRACZYK, Grzegorz ŚWIATEK. — **The real Fatou conjecture.** — Annals of mathematics studies, No. 144. — Un vol. broché, 15,5×23,5, de VIII, 148 p. — ISBN 0-691-00258-4. — Prix: US$22.50. — Princeton University Press, Princeton, 1998.

In 1920, Pierre Fatou expressed the conjecture that all critical points of a rational map of the Riemann sphere tend to periodic orbits under iteration. This conjecture remains the main open problem in the dynamics of iterated maps. In this book, the authors provide a rigorous proof of the Real Fatou Conjecture. In spite of the apparently elementary nature of the problem, its solution requires advanced tools of complex analysis. The authors have written a self-contained and complete version of the argument, accessible to someone with no knowledge of complex dynamics and only basic familiarity with interval maps.

M.G. NADKARNI. — **Basic ergodic theory.** — Second edition. — Birkhäuser advanced texts. — Un vol. relié, 17×24, de VI, 149 p. — ISBN 3-7643-5816-5. — Prix: SFr. 58.00. — Birkhäuser Verlag, Basel, 1995.

A new feature of the book is that the basic topics of ergodic theory such as the Poincaré recurrence lemma, induced automorphisms and Kakutani towers, compressibility and E. Hopf's theorem, the theorem of Ambrose on representation of flows are treated at the descriptive set-theoretic level before their measure-theoretic or topological versions are presented. In addition, topics centering around the Glimm-Effros theorem are discussed, topics which have so far not found a place in texts on ergodic theory. In this second edition, a section on rank one automorphisms and a brief discussion of the ergodic theorem due to Wiener and Wintner have been added.

M.G. NADKARNI. — **Spectral theory of dynamical systems.** — Birkhäuser advanced texts. — Un vol. relié, 17,5×24, de VII, 182 p. — ISBN 3-7643-5817-3. — Prix: SFr. 78.00. — Birkhäuser Verlag, Basel, 1998.

This book introduces some basic topics in the spectral theory of dynamical systems, but also includes advanced topics such as a theorem due to H. Helson and W. Parry, and another due to B. Host. Moreover, Ornstein's family of mixing rank one automorphisms is described with construction and proof. Systems of imprimitivity, and their relevance to ergodic theory, are discussed. Baire category theorems of ergodic theory, scattered in the literature, are derived in a unified way. Riesz products are considered, and they are used to describe the spectral types and eigenvalues of rank one automorphisms.

Equations aux différences finies, équations fonctionnelles

Peter A. CLARKSON, Frank W. NIJHOFF, (Editors). — **Symmetries and integrability of difference equations.** — London Mathematical Society lecture note series, vol. 255. — Un vol. broché, 15,5×23, de XVI, 424 p. — ISBN 0-521-59699-8. — Prix: £27.95. — Cambridge University Press, Cambridge, 1999.

There has, in recent years, been a remarkable growth of interest in the area of discrete integrable systems. Much progress has been made by applying symmetry groups to the study of

differential equations, and connections have been made to other topics such as numerical methods, cellular automata and mathematical physics. This volume is comprised of state-of-the-art articles from almost all the leading workers in this important and rapidly developing area, making it a necessary resource for all researchers interested in discrete integrable systems or related subjects.

Approximations et développements en série

N.K. GOVIL, R.N. MOHAPATRA, Z. NASHED, A. SHARMA, J. SZABADOS, (Editors). — **Approximation theory: in memory of A.K. Varma.** — Pure and applied mathematics, vol. 212. — Un vol. relié, 16×23,5, de XXII, 517 p. — ISBN 0-8247-0185-2. — Prix: US$ 195.00. — Marcel Dekker, Inc., New York, 1998.

This work honors A.K. Varma's indelible contributions to the field of approximation theory with a collection of over 30 carefully selected papers by 45 internationally distinguished mathematicians, reflecting his lifelong passion for investigating subjects such as interpolation by polynomials and splines, quadrature formulae, order of pointwise and uniform approximation of finitely differentiable functions by polynomials, and Bernstein and Markov type inequalities in L^p and uniform metrics.

Analyse de Fourier, analyse harmonique abstraite

Christian BLATTER. — **Wavelets: a primer.** — Un vol. relié, 16×23,5, de X, 202 p. — ISBN 1-56881-095-4. — Prix: US$ 32.00. — A.K. Peters, Natick, 1998.

The wavelet transform, with its many applications, has become a major new mathematical technique. It has stimulated research unparalleled since the invention of the Fast Fourier Transform (FFT) and opened new avenues of application in signal processing, image compression, radiology, cardiology, and many other areas. This book grew out of a short course for mathematics students at the ETH in Zürich; it provides a solid, yet accessible, mathematical foundation for those interested in learning about wavelets and pursuing the broad range of applications for which the wavelet transform has proved successful.

C. GASQUET, P. WITOMSKI. — **Fourier analysis and applications: filtering, numerical computation, wavelets.** — Translated by R. Ryan. — Texts in applied mathematics, vol. 30. — Un vol. relié, 16×24, de XVIII, 442 p. — ISBN 0-387-98485-2. — Prix: DM 98.00. — Springer, New York, 1999.

The object of this text, which focuses on Fourier analysis, signal analysis, and filters, is twofold. On the one hand, it conveys to the mathematician a rigorous presentation illustrated with important practical applications of the theory, including a discussion of the Fast Fourier Transform. On the other hand it imparts to the physicist and engineer a body of theory in which the well-known formulae find their justification. There is a systematic development of fundamental concepts, such as the Lebesgue integration and theory of distributions, which allows one to establish precise relations among several domains: Fourier transform and convolution; filtering and sampling; and time-frequency analysis (Gabor transforms and wavelets).

Abdul J. JERRI. — **The Gibbs phenomenon in Fourier analysis, splines and wavelet approximations.** — Mathematics and its applications, vol. 446. -Un vol. relié, 16,5×24,5, de XXVII, 336 p. — ISBN 0-7923-5109-6. — Prix: Dfl. 300.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This is the first book dedicated to covering the basic elements of the Gibbs phenomenon as it appears in various applications where functions with jump discontinuities are represented. It

is presented with detailed analysis and illustrations combined with historical information. The author covers the appearance of the Gibbs phenomenon in Fourier analysis, orthogonal expansions, integral transforms, splines and wavelet approximations. Methods of reducing, or filtering out, such phenomena that cover all the above function representations are also addressed. The book includes a thorough bibliography of some 350 references.

Transformations intégrales, calcul opérationnel

M.W. WONG. — **Weyl transforms.** — Universitext. — Un vol. relié, 16×24, de VIII, 158 p. — ISBN 0-387-98414-3. — Prix: DM 89.00. — Springer, New York, 1998.

The functional analytic properties of Weyl transforms as bounded linear operators on $L^2(\mathbf{R}^n)$ are studied in terms of the symbols of the transforms. The boundedness, the compactness, the spectrum, and the functional calculus of the Weyl transform are proved in detail. New results and techniques on the boundedness and compactness of the Weyl transforms in terms of the symbols in $L^r(\mathbf{R}^{2n})$ and in terms of the Wigner transforms of Hermite functions are given. Background materials are given in adequate detail to enable a graduate student to proceed rapidly from the very basics to the frontier of research in an area of operator theory.

Equations intégrales

Donal O'REGAN and Maria MEEHAN. — **Existence theory for nonlinear integral and integrodifferential equations.** — Mathematics and its applications, vol. 445. — Un vol. relié, 16,5×24,5, de 218 p. — ISBN 0-7923-5089-8. — Prix: Dfl. 190.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book presents an up-to-date account of many topics of current interest in the theory of nonlinear ordinary differential equations. They include fixed point theory, periodic problems, lower and upper surfaces, positone and semi-positone problems, singular equations, limit circle problems, finite and infinite interval problems, and impulsive differential equations. In addition many important applications are presented to complement the theory.

Analyse fonctionnelle et théorie des opérateurs

Ernst ALBRECHT, Martin MATHIEU, (Editors). — **Banach algebras '97.** — Proceedings of the 13th International Conference on Banach Algebras, held at the Heinrich Fabri Institute of the University of Tübingen in Blaubeuren, July 20 — August 3, 1997. — Un vol. relié, 18×24,5, de IX, 566 p. — ISBN 3-11-015466-8. — Prix: DM 328.00. — Walter de Gruyter, 1998.

This volume contains refereed research articles on Banach algebras and related areas by speakers at the 13th International Conference on Banach algebras 1997. Particular topics include algebraic structure of Banach algebras, dual Banach algebras and invariant subspaces, automatic continuity, local spectral theory, algebras of analytic functions, amenability and Banach homology as well as applications in harmonic analysis. Some papers discuss the interplay with Fredholm theory, differential and pseudo-differential operators, several variable spectral theory or nonassociative normed algebras. This book is of interest to researchers and graduate students in functional analysis, algebra, and topology.

Sergey BAGDASAROV. — **Chebyshev splines and Kolmogorov inequalities.** — Operator theory: advances and applications, vol. 105. — Un vol. relié, 17,5×24, de XIII, 205 p. — ISBN 3-7643-5984-6. — Prix: SFr. 148.00. — Birkhäuser Verlag, Basel, 1998.

This monograph describes advances in the theory of extremal problems in classes of functions defined by a majorizing modulus of continuity ω. In particular, an extensive account

is given of structural, limiting, and extremal properties of perfect ω-splines generalizing standard polynomial perfect splines in the theory of Sobolev classes. In this context special attention is paid to the qualitative description of Chebyshev ω-splines and ω-polynomials associated with the Kolmogorov problem of n-widths and sharp additive inequalities between the norms of intermediate derivatives in functional classes with a bounding modulus of continuity. Since, as a rule, the techniques of the theory of Sobolev classes are inapplicable in such classes, novel geometrical methods are developed based on entirely new ideas.

Béla BOLLOBAS. — **Linear analysis: an introductory course.** — Second edition. — Un vol. broché, 15×23, de XI, 240 p. — ISBN 0-521-65577-3. — Prix: £16.95. — Cambridge University Press, Cambridge, 1999.

Now revised and up-dated, this introduction to functional analysis is intended for advanced undergraduate students. The author's aim is not just to cover the standard material in a standard way, but to present results of applications in contemporary mathematics and to show the relevance of functional analysis to other areas. Unusual topics covered include the geometry of finite-dimensional spaces, invariant subspaces, fixed-point theorems, and the Bishop-Phelps theorem. An outstanding feature is the large number of exercises, some straightforward, some challenging, none uninteresting.

Ronald CROSS. — **Multivalued linear operators.** — Pure and applied mathematics. vol. 213. — Un vol. relié, 16×23,5, de X, 335 p. — ISBN 0-8247-0219-0. — Prix: US$ 150.00. — Marcel Dekker, Inc., New York, 1998.

The book describes set-valued mappings relating one subspace of a normed linear space to another... analyzes perturbation theory and stability...details the boundedness and compactness of linear relations... uses density invariance to characterize linear relations...discusses linear selections and dimensionality, index and coindex... outlines polar relationships and the category theorems of functional analysis... contains never-before-published material in book form on index properties in algebraic theory, closable linear relations, the theory of single-valued linear operators, partially and nowhere continuous linear relations... etc.

A. DIJKSMA, I. GOHBERG, M.A. KAASHOEK, R. MENNICKEN, (Editors). — **Contributions to operator theory in spaces with an indefinite metric: the Heinz Langer anniversary volume.** — Operator theory: advances and applications, vol. 106. — Un vol. relié, 17,5×24, de VI, 417 p. — ISBN 3-7643-6003-8. — Prix: SFr. 168.00. — Birkhäuser Verlag, Basel, 1998.

This volume is dedicated to Heinz Langer on the occasion of his 60th birthday. The book begins with his biography and list of publications. It contains a selection of research papers, most of which are devoted to spectral analysis of operators or operator pencils with applications to ordinary and partial differential equations. Other papers deal with time-varying systems, interpolation and factorization problems, and topics from mathematical physics. About half of the papers contain further developments in the theory of operators in spaces with an indefinite metric and treat new applications. The book is of interest to a wide audience of pure and applied mathematicians.

F.G. FRIEDLANDER. — **Introduction to the theory of distributions.** — With additional material by M. JOSHI.- Second edition. — Un vol. broché, 15×23, de VII, 175 p. — ISBN 0-521-64971-4. — Prix: £15.95 (relié: £42.50). — Cambridge University Press, Cambridge, 1999.

The theory of distributions is an extension of classical analysis which has acquired a particular importance in the field of linear partial differential equations, as well as having many

other applications, for example in harmonic analysis. Underlying it is the theory of topological vector spaces, but it is possible to give a systematic presentation without presupposing a knowledge, or using more than a bare minimum, of this. This book adopts this course and is based on graduate lectures given over a number of years. In this second edition, the notion of the wavefront set of a distribution is introduced in an additional chapter contributed by Mark Joshi. This allows many operations on distributions to be extended and gives a much more precise understanding of the nature of the singularities of a distribution.

I. GOHBERG, R. MENNICKEN, C. TRETTER, (Editors). — **Differential and integral operators.** — International Workshop on Operator Theory and Applications, IWOTA 95, in Regensburg, July 31-August 4, 1995. — Operator theory: advances and applications, vol. 102. — Un vol. relié, 17×24, de XII, 324 p. — ISBN 3-7643-5890-4. — Prix: SFr. 148.00. — Birkhäuser Verlag, Basel, 1998.

The conference covered different aspects of linear and nonlinear spectral problems, starting with problems for abstract operators up to spectral theory of ordinary and partial operators, pseudodifferential operators, and integral operators. The workshop was also focussed on operator theory in spaces with indefinite metric, operator functions, interpolation and extension problems. The applications concerned applications to mathematical physics, hydrodynamics, magnetohydrodynamics, quantum mechanics, astrophysics as well as the theory of networks and systems. Its companion volume (OT 103), entitled *Recent Progress in Operator Theory*, complements the other aspects of operator theory covered in the workshop.

I. GOHBERG, R. MENNICKEN, C. TRETTER, (Editors). — **Recent progress in operator theory.** — International Workshop on Operator Theory and Applications, IWOTA 95, in Regensburg, July 31-August 4, 1995. — Operator theory: advances and applications, 9 vol. 103. — Un vol. relié, 17×24, de X, 283 p. — ISBN 3-7643-5891-2. — Prix: SFr. 148.00. — Birkhäuser Verlag, Basel, 1998.

The papers in the two volumes of the proceedings of IWOTA 95 bring the readers up to date on recent achievements in these areas. This volume contains the contributions to different aspects of operator theory and its applications. Its companion volume (OT 102), entitled *Differential and Integral Operators*, is focussed especially on differential and integral operators. The set will be of practical use to a wide-range readership in pure and applied mathematics, physics and engineering sciences.

Robert E. MEGGINSON. — **An introduction to Banach space theory.** — Graduate texts in mathematics, vol. 183. — Un vol. relié, 16×24, de XIX, 596 p. — ISBN 0-387-98431-3. — Prix: DM 134.00. — Springer, New York, 1998.

The purpose of this book is to provide an introduction to the basic theory of Banach spaces and functional analysis. It prepares students for further study of both the classical works and current research. It is accessible to students who understand the basic properties of L^p spaces but have not had a course in functional analysis. The book is sprinkled liberally with examples, historical notes, and references to original sources. Over 450 exercises provide supplementary examples and counterexamples and give students practice in the use of the results developed in the text.

V.S. SUNDER. — **Functional analysis: spectral theory.** — Birkhäuser Advanced Texts. — Un vol. relié, 17×24, de IX, 241 p. — ISBN 3-7643-5892-0. — Prix: SFr. 68.00. — Birkhäuser Verlag, Basel, 1997.

This book presents the concepts of functional analysis required by students of mathematics and physics. It begins with the basics of normed linear spaces and quickly proceeds to

concentrate on Hilbert spaces, specifically the spectral theorem for bounded as well as unbounded operators in separable Hilbert spaces. While the first two chapters are devoted to basic propositions concerning normed vector spaces and Hilbert spaces, the third chapter treats advanced topics which are perhaps not standard in a first course on functional analysis (a detour into operator algebras). The fourth chapter reverts to more standard operator theory in Hilbert space, dwelling on topics such as the spectral theorem for normal operators, the polar decomposition theorem, and the Fredholm theory for compact operators.

Calcul des variations

Andrea BRAIDES, Anneliese DEFRANCESCHI. — **Homogenization of multiple integrals.** — Oxford lecture series in mathematics and its applications, vol. 12. — Un vol. relié, 16,5×24, de XIV, 298 p. — ISBN 0-19-850246-X. — Prix: £40.00. — Clarendon Press, Oxford, 1998.

Homogenization results and appropriate descriptive formulae are given for periodic and almost periodic functionals. Applications are described to the asymptotic behaviour of oscillating energies describing cellular hyperelastic materials, porous media, materials with stiff and soft inclusions, and fibred media; to homogenization of Hamilton-Jacobi equations and Riemannian metrics, and to materials with multiple scales of microstructure and with multidimensional structure. There is a self-contained and up-to-date introduction to the relevant results of the direct methods of Γ-convergence and of the theory of weak lower semi-continuous integral functions that depend on vector-valued functions.

Jürgen JOST, Xianqing LI-JOST. — **Calculus of variations.** — Cambridge studies in advanced mathematics, vol. 64. — Un vol. relié, 16×23,5, de XVI, 323 p. — ISBN 0-521-64203-5. — Prix: £37.50. — Cambridge University Press, Cambridge, 1999.

One-dimensional problems and classical issues like Euler-Lagrange equations are treated, as are Noether's theorem, Hamilton-Jacobi theory, and in particular geodesic lines, thereby developing some important geometric and topological aspects. The basic ideas of optimal control theory are also given. The second part of the book deals with multiple integrals. After a review of Lebesgue integration, Banach and Hilbert space theory and Sobolev spaces (with complete details and proofs), there is a treatment of the direct methods and the fundamental lower semicontinuity theorems. Subsequent chapters introduce the basic concepts of the modern calculus of variations, namely relaxation, Gamma convergence, bifurcation theory and minimax methods based on the Palais-Smale condition.

Géométrie

Jack B. KUIPERS. — **Quaternions and rotation sequences: a primer with applications to orbits, aerospace, and virtual reality.** — Un vol. relié, 20×26, de XXII, 371 p. — ISBN 0-691-05872-5. — Prix: £35.00. — Princeton University Press, Princeton, distributed by John Wiley & Sons, Chichester, 1999.

In this book, the author introduces quaternions for scientists and engineers who have not encountered them before and shows how they can be used in a variety of practical situations. The opening chapters present introductory material and establish the book's terminology and notation. The next part presents the mathematical properties of quaternions, including quaternion algebra and geometry. It includes more advanced special topics in spherical trigonometry, along with an introduction to quaternion calculus and perturbation theory. In the final section, the author discusses state-of-the-art applications.

Robin J.Y. McLeod, M. Louisa Baart. — **Geometry and interpolation of curves and surfaces.** — Un vol. relié, 16×23,5, de xiv, 414 p. — ISBN 0-521-32153-0. — Prix: £50.00. — Cambridge University Press Cambridge, 1998.

The authors start with simple interpolation, including splines. They extend these simple procedures to the production of conic sections and then introduce projective coordinates as tools for dealing with higher-order curves and such important concepts as singular points. They present many applications and concrete examples, including an analysis of the rational and polynomial cubics, parabolic interpolation, geometric approximation, and the numerical solution of trajectory problems. In the final chapter they apply the basic theory to the construction of finite-element basis functions and surface interpolants over nonregular shapes and discuss the simple cases of the Steiner surface and the cubic surface.

Burkard Polster. — **A geometrical picture book.** — Universitext. — Un vol. relié, 16,5×24,5, de xx, 291 p. — ISBN 0-387-98437-2. — Prix: DM 98.00. — Springer, New York, 1998.

Pictures are what this book is all about; original pictures of everybody's favorite geometries such as configurations, projective planes and spaces, circle planes, generalized polygons, mathematical biplanes, and other designs which capture much of the beauty, construction principles, particularities, substructures, and interconnections of these geometries. This guided tour includes lots of stereograms of the spatial models, games and puzzles and instructions on how to construct your own pictures and build some of the spatial models yourself.

Hendrik van Maldeghem. — **Generalized polygons.** — Monographs in mathematics, vol. 93. — Un vol. relié, 17,5×24, de xv, 502 p. — ISBN 3-7643-5864-5. — Prix: SFr. 178.00. — Birkhäuser Verlag, Basel, 1998.

This book is the first book to cover, in a coherent manner, the theory of polygons from scratch. In particular, it fills elementary gaps in the literature and gives an up-to-date account of current research in this area, including most proofs, which are often unified and streamlined in comparison to the versions generally known. The approach taken in the book is of geometric nature, but algebraic results are included and proven (in a geometric way). A noteworthy feature is that the book unifies and generalizes notions, definitions and results that exist for quadrangles, hexagons, octagons — in the literature very often considered separately — to polygons.

Géométrie différentielle

Thierry Aubin. — **Some nonlinear problems in Riemannian geometry.** — Springer monographs in mathematics. — Un vol. relié, 16,5×24,5, de xvii, 395 p. — ISBN 3-540-60752-8. — Prix: DM 168.00. — Springer, Berlin, 1998.

During the last few years, the field of nonlinear problems has undergone great development. This book, the core of which is the content of the author's earlier book (Springer 1983), updated and extended in each chapter, and augmented by several completely new chapters, deals with some important geometric problems that have only recently been solved or partially solved. Each problem is explained with the present status of its solution and the most recent methods of approaching the proofs. The main aim is to explain some methods and new techniques, and to apply them to problems coming from geometry or from physics.

Topologie générale

Dušan REPOVS, Pavel Vladimirovič SEMENOV. — **Continuous selections of multivalued mappings.** — Mathematics and its applications, vol. 455. — Un vol. relié, 17×25, de VIII, 356 p. — ISBN 0-7923-5277-7. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book is the first systematic and comprehensive study of the theory of continuous selections of multivalued mappings. This interesting branch of modern topology was introduced by E.A. Michael in the 1950s and has since witnessed an intensive development with various applications outside topology, e.g. in geometry of Banach spaces, manifolds theory, convex sets, fixed points theory, differential inclusions, optimal control, approximation theory, and mathematical economics. The work can be used in different ways: the first part is an exposition of the basic theory, with details. The second part is a comprehensive survey of the main results. Lastly, the third part collects various kinds of applications of the theory.

Topologie algébrique

Michael CRABB, Ioan JAMES. — **Fibrewise homotopy theory.** — Springer monographs in mathematics. — Un vol. relié, 16×24, de VIII, 341 p. — ISBN 1-85233-014-7. — Prix: DM 159.00. — Springer, London, 1998.

Topology occupies a central position in the mathematics of today. One of the most useful ideas to be introduced in the past sixty years is the concept of the fibre bundle, which provides an appropriate framework for studying differential geometry and much else. In this book, fibrewise homotopy theory is developed ab initio, assuming only a basic knowledge of ordinary homotopy theory. The first half of the text provides a survey, beginning with an outline of the basic theory and proceeding to a selection of more specialized topics. The second is concerned with the corresponding stable theory, with some emphasis on theory appropriate for geometric applications.

Glenys LUKE and Alexander S. MISHCHENKO. — **Vector bundles and their applications.** — Mathematics and its applications, vol. 447. — Un vol. relié, 16,5×24,5, de VIII, 254 p. — ISBN 0-7923-5154-1. — Prix: Dfl. 240.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The book is devoted to the basic notions of vector bundles and their applications. The focus of attention is towards explaining the most important notions and geometric constructions connected with the theory of vector bundles. Theorems are not always formulated in maximal generality but rather in such a way that the geometric nature of the objects comes to the fore. Whenever possible examples are given to illustrate the role of vector bundles. *Contents:* Introduction to the locally trivial bundles theory. — Homotopy invariants of vector bundles. — Geometric constructions of bundles. — Calculation methods in K-theory. — Elliptic operators on smooth manifolds and K-theory. — Some applications of vector bundle theory.

Topologie des variétés, analyse globale et analyse des variétés

Frédéric PHAM. — **Géométrie et calcul différentiel sur les variétés: cours, études et exercices.** — 2e édition. — Sciences supérieures. Mathématiques. — Un vol. broché, 17×24, de XII, 260 p. — ISBN 2-10-004129-0. — Prix: FF 215.00. — Dunod, Paris, 1999.

La première partie a pour but de consolider les acquis essentiels du calcul différentiel de licence. Elle a été profondément remaniée pour cette deuxième édition. La deuxième partie

présente la théorie intrinsèque des variétés (avec comme objectif essentiel la compréhension des notions de fibré tangent et fibré normal) et enchaîne sur les premiers rudiments de la topologie algébrique (homotopie et revêtements). Elle se termine par une ébauche de théorie de l'intégration sur les variétés, où l'on fait connaissance avec l'homologie et la cohomologie.

Andrew RANICKI. — **High dimensional knot theory: algebraic surgery in codimension 2.** — With an appendix by Elmar WINKELNKEMPER. — Springer monographs in mathematics. — Un vol. relié, 16×24, de XXXVI, 646 p. — ISBN 3-540-63389-8. — Prix: DM 189.00. — Springer, Berlin, 1998.

This is the first book entirely devoted to high-dimensional knots. The main theme is the application of the author's algebraic theory of surgery to provide a unified treatment of the invariants of codimension 2 embeddings, generalizing the Alexander polynomials and Seifert forms of classical knot theory. Many results in the research literature are thus brought into a single framework, and new results are obtained. The treatment is particularly effective in dealing with open books, which are manifolds with codimension 2 submanifolds such that the complement fibres over a circle.

Robert ROUSSARIE. — **Bifurcations of planar vector fields and Hilbert's sixteenth problem.** — Progress in mathematics, vol. 164. — Un vol. relié, 16×24, de XVII, 204 p. — ISBN 3-7643-5900-5. — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1998.

In a coherent, exhaustive and progressive way, this book presents the tools for studying local bifurcations of limit cycles in families of planar vector fields. A systematic introduction is given to such methods as division of an analytic family of functions in its ideal coefficients, and asymptotic expansion of non-differentiable return maps and desingularisation. The exposition moves from classical analytic geometric methods applied to regular limit periodic sets to more recent tools for singular limit sets. The methods can be applied to theoretical problems such as Hilbert's 16th problem, but also for the purpose of establishing bifurcation diagrams of specific families as well as explicit computations.

David SPRING. — **Convex integration theory: solutions to the *h*-principle in geometry and topology.** — Monographs in mathematics, vol. 92. — Un vol. relié, 17×24, de VIII, 212 p. — ISBN 3-7643-5805-X. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1998.

This book provides a comprehensive study of convex integration theory in immersion-theoretic topology. This book is the first to present an exacting record and exposition of all of the basic concepts and technical results of convex integration theory in higher order jet spaces, including the theory of iterated convex hull extensions and the theory of relative *h*-principles. A second feature of the book is its detailed presentation of applications of the general theory to topics in symplectic topology, divergence free vector fields on 3-manifolds, isometric immersions, totally real embeddings, underdetermined non-linear systems of PDEs, the relaxation theorem in optimal control theory, as well as applications to the traditional immersion-£ theoretical topics such as immersions, submersions, *k*-mersions and free maps.

Probabilités et processus stochastiques

Richard F. BASS. — **Diffusions and elliptic operators.** — Probability and its applications. — Un vol. relié, 15,5×24, de XIII, 232 p. — ISBN 0-387-98315-5. — Prix: DM 118.00. — Springer, New York, 1998.

This book discusses the interplay of diffusion processes and partial differential equations (PDEs) with an emphasis on probabilistic methods in PDEs. It begins with stochastic

differential equations, the probabilistic machinery needed to study PDEs. After spending three chapters on probabilistic representations of solutions for PDEs, regularity of solutions, and one-dimensional diffusions, the author discusses in depth two main types of second-order linear differential operators: nondivergence operators and divergence operators, including such topics as the Harnack inequality of Krylov-Safonov for nondivergence operators and heat kernel estimates for divergence form operators. Martingales problems and the Malliavin calculus are presented in two other chapters.

Jean BERTOIN. — **Lévy processes.** — Cambridge tracts in mathematics, vol. 121. — Un vol. broché, 15,5×23, de x, 266 p. — ISBN 0-521-64632-4. — Prix: £37.50. — Cambridge University Press, Cambridge, 1998.

This is an up-to-date and comprehensive account of the theory of Lévy processes. This branch of modern probability theory has been developed over recent years and has many applications in such areas as queues, mathematical finance and risk estimation. Professor Bertoin has used the powerful interplay between the probabilistic structure and analytic tools to give a quick and concise treatment of the core theory, with the minimum of technical requirements. Special properties of subordinators are developed and then appear as key features in the study of the local times of real-valued Lévy processes and in fluctuation theory. Lévy processes with no positive jumps receive special attention, as do stable processes.

Amir DEMBO, Ofer ZEITOUNI. — **Large deviations techniques and applications.** — Second edition. — Applications of mathematics. — Un vol. relié, 16×24, de XVI, 396 p. — ISBN 0-387-98406-2. — Prix: DM 124.00. — Springer, New York, 1998.

In view of the diversity of its applications, there is a wide range in the backgrounds of those who are to apply the theory of large deviations. This book provides an exposition geared towards such different audiences. While the format and numbering sequence of the first edition have been kept, new material has been added concerning concentration inequalities and the metric and weak convergence approaches to large deviations. In addition to being useful to many applications this material helps in placing large deviations theory within the general framework of probability theory. Reflecting other recent developments in the area of large deviations, general statements and applications have been sharpened, new exercises added, and the bibliography updated.

Ernst EBERLEIN, Marjorie HAHN, Michel TALAGRAND, (Editors). — **High dimensional probability.** — Progress in probability, vol. 43. — Un vol. relié, 16,5×24, de VIII, 330 p. — ISBN 3-7643-5867-X. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1998.

What is high dimensional probability? Under this broad term one finds a collection of topics associated by the fact that is expressed in the problem or in the methods by which it is approached. For example, the study of probability in Banach spaces gave impetus to a number of methods whose importance has gone far beyond the original goal of extending limit laws to the vector valued case. Many of the new ideas, results and directions of this newly evolving field were explored on a broad front at the Conference on High Dimensional Probability held at Oberwolfach in August 1996.

Vladimir FOMIN. — **Optimal filtering, vol. 1: Filtering of stochastic processes.** — Mathematics and its applications, vol. 457. — Un vol. relié, 16,5×25, de IX, 375 p. — ISBN 0-7923-5286-6. — Prix: Dfl. 320.00. — Kluwer Academic Publisher, Dordrecht, 1999.

This book considers methods of optimal signal processing. The generalized filtering theory presented includes both highly developed, now classical branches like Wiener-Kolmogorov and

Kalman-Bucy theories, as well as relatively new branches such as semidegenerate processes and minimax filtering. The unique two-level approach to filtering problems is applied depending on their complexity. Starting with conventional notions of filtering theory, in terms of difference-differential models, the research proceeds to notions and constructions of functional analysis convenient for analysing linear filtering problems. Many novel results on filtering theory are also introduced.

Laurent MAZLIAK, Pierre PRIOURET, Paolo BALDI. — **Martingales et chaînes de Markov.** — Collection Méthodes. — Un vol. broché, 15×22, de VIII, 215 p. — ISBN 2-7056-6382-7. — Prix: FF 180.00. — Hermann, Paris, 1998.

Cet ouvrage a pour origine le cours de processus aléatoires de la maîtrise de mathématiques de l'Université Pierre-et-Marie-Curie (Paris VI). Il contient de nombreux exercices et problèmes sur les martingales et les chaînes de Markov à temps discret, corrigés de manière détaillée. Chaque chapitre est précédé de substantiels rappels de cours incluant la plupart du temps des démonstrations. Les problèmes apportent des compléments permettant au lecteur d'approfondir ses connaissances en abordant des résultats plus avancés de la théorie. Cet ouvrage est principalement destiné aux étudiants de deuxième cycle et aux candidats à l'agrégation.

Michel WEBER. — **Entropie métrique et convergence presque partout.** — Travaux en cours, vol. 58. — Un vol. broché, 17×24, de 150 p. — ISBN 2-7056-6381-9- — Prix: FF 180.00. — Hermann, Paris, 1998.

L'interaction fructueuse entre la théorie des probabilités et la théorie ergodique, amorcée par Stein et surtout, plus récemment, par Bourgain et Talagrand, exploite efficacement des méthodes d'entropie métrique appartenant à la théorie des processus stochastiques. L'auteur apporte une présentation, un commentaire et des démonstrations détaillées des critères d'entropie métrique de Bourgain ainsi que des siens propres, d'un point de vue probabiliste. Les outils gaussiens mis en œuvre, ainsi que les propriétés fondamentales des processus gaussiens, sont présentés de façon claire et accessible pour le lecteur ergodicien non spécialiste des processus gaussiens.

G. George YIN, Qing ZHANG. — **Continuous-time Markov chains and applications: a singular perturbation approach.** — Applications of mathematics, vol. 37. — Un vol. relié, 16,5×24,5, de XV, 349 p. — ISBN 0-387-98244-2. — Prix: DM 118.00. — Springer, New York, 1998.

This book discusses continuous-time Markov chains and applications. Using a singular perturbation approach, it presents a systematic treatment of singularly perturbed systems that naturally arise in queueing theory, control and optimization, and manufacturing systems. It gathers a number of ideas in Markov chains and singular perturbations that are scattered hroughout the literature. It presents results on asymptotic expansions of the corresponding probability distributions, functional occupation measures, exponential upper bounds, and asymptotic normality. The emphasis is on Markov chains with weak and strong interactions and structural properties.

Statistique

A.A. BOROVKOV. — **Mathematical statistics.** — Transl. from the Russian by A. Moullagaliev. — Un vol. relié, 19×26, de XXI, 570 p. — ISBN 90-5699-018-7. — Prix: £89.00. — Gordon and Breach Science Publishers, Amsterdam, 1998.

The author presents classical results and methods which form the basis of modern statistics, and examines the foundations of estimation theory, hypothesis testing theory, and statistical

game theory. He goes on to consider statistical problems for two or more samples, and those in which observations are taken from different distributions. Methods of finding optimal and asymptotically optimal statistical procedures are given, along with treatments of homogeneity testing, regression, variance analysis, and pattern recognition. The author also posits a number of methodological improvements which simplify proofs, and brings together a number of new results which have never before been published in a single monograph. This monograph, by an acknowledged world leader in the field, combines maximum clarity with mathematical rigor.

Françoise COUTY, Jean DEBORD, Daniel FREDON. — **Probabilités et statistiques: résumés de cours et 157 exercices et problèmes corrigés.** — Sciences supérieures. Mathématiques. — Un vol. broché, 14×22, de 207 p. — ISBN 2-10-004240-8. — Prix: FF 98.00. — Dunod, Paris, 1999.

Ce livre est destiné en priorité aux étudiants des premiers cycles biologiques, médicaux ou agricoles (DEUG SV et ST, PCEM, Pharmacie, IUT, BTS...), mais d'une manière plus générale, à tous ceux qui utilisent des statistiques en biologie. Trois parties composent cet ouvrage: d'abord la statistique descriptive, ensuite le calcul des probabilités, enfin, au carrefour de ces deux domaines, les lois statistiques, l'échantillonnage et l'estimation. Les tables numériques sont données en annexe. Des rappels de cours procurent sous une forme concise les définitions et les formules qu'il faut connaître. Ils sont accompagnés de 157 exercices et problèmes, originaux ou bien tirés de sujets d'examens et tous corrigés.

Gary J. ERICKSON, Joshua T. RYCHERT and C. Ray SMITH, (Editors). — **Maximum entropy and Bayesian methods: Boise, Idaho, U.S.A., 1997.** — Proceedings of the 17th International Workshop on Maximum Entropy and Bayesian Methods of Statistical Analysis. — Fundamental theories of physics, vol. 98. — Un vol. relié, 16.5×24.5, de IX, 297 p. — ISBN 0-7923-5047-2. — Prix: Dfl. 245.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume contains a wide range of applications of Bayesian statistics and maximum entropy methods to problems of concern in such fields as image processing, coding theory, machine learning, economics, data analysis and various other problems. It is a compendium of papers by the leading researchers in the field of Bayesian statistics and maximum entropy methods and represents the latest developments in the field.

Ioannis KARATZAS, Steven E. SHREVE. — **Methods of mathematical finance.** — Applications of mathematics: stochastic modelling and applied probability, vol. 39. — Un vol. relié, 16.5×24.5, de XV, 407 p. — ISBN 0-387-94839-2. — Prix: DM 129.00. — Springer, New York, 1998.

This book is the sequel to *Brownian Motion and Stochastic Calculus* by the same authors. Within the context of Brownian-motion-driven asset prices, it develops contingent claim pricing and optimal consumption/investment in both complete and incomplete markets. The latter topic is extended to a study of equilibrium, providing conditions for the existence and uniqueness of market prices which support trading by several heterogeneous agents. Although much of the incomplete-market material is available in research papers, these topics are treated for the first time in a unified manner. The book contains an extensive set of references and notes describing the field, including topics not treated in the text.

Chap T. LE. — **Applied categorical data analyis.** — Wiley series in probability and statistics. Texts and references section. — Un vol. broché, 15.5×23.5, de XI, 287 p. — ISBN 0-471-24060-5. — Prix: £50.00. — John Wiley and Sons, Inc., New York, 1998.

This self-contained volume provides up-to-date coverage of all major methodologies in the area of applied statistics and acquaints the reader with statistical thinking as expressed through

a variety of modern-day topics and techniques. The book introduces a number of new research areas, including the Mantel-Haenszel method, Kappa statistics, ordinal risks, odds ratio estimates, goodness-of-fit, and various regression models for categorical data. The author presents his information in a user-friendly format and an accessible style while purposefully keeping the mathematics to a level appropriate for students in applied fields. The book is well supplemented with helpful graphs and tables.

Michel NOVI. — **Pourcentages et tableaux statistiques.** — Que sais-je?, vol. 3337. — Un vol. broché, 11,5×18, de 126 p. — ISBN 2-13-048880-3. — Prix: FF 42.00. — Presses universitaires de France, Paris, 1998.

Cet ouvrage traite des pourcentages en analyse statistique. Il se consacre aux méthodes descriptives et les présente par complexité croissante, le seul outil requis demeurant la règle de trois. L'étude et la mesure de l'association font l'essentiel de ce livre qui s'adresse à tous publics, mais en particulier aux étudiants des disciplines pour lesquelles l'usage des échelles nominales est intensif. En se limitant au niveau descriptif, ce livre ne requiert aucun bagage mathématique.

A.W. VAN DER VAART. — **Asymptotic statistics.** — Cambridge series in statistical and probabilistic mathematics. — Un vol. relié, 18,5×26, de XV, 443 p. — ISBN 0-521-49603-9. — Prix: £40.00. — Cambridge University Press, Cambridge, 1998.

This book is an introduction to the field of asymptotic statistics. In addition to most of the standard topics of an asymptotics course, including likelihood inference, M-estimation, asymptotic efficiency, U-statistics, and rank procedures, the book also presents recent research topics such as semiparametric models, the bootstrap, and empirical processes and their applications. One of the unifying themes is the approximation by limit experiments. This entails mainly the local approximation of the classical i.i.d. set-up with smooth parameters by location experiments involving a single, normally distributed observation. Thus, even the standard subjects of asymptotic statistics are presented in a novel way.

Analyse numérique

Zhongying CHEN, Charles A. MICCHELI, Yuesheng XU, (Editors). — **Advances in computational mathematics.** — Proceedings of the Guangzhou International Symposium. — Pure and applied mathematics, vol. 202. — Un vol. broché, 18×25,5, de XX, 604 p. — ISBN 0-8247-1946-8. — Prix: US$ 175.00. — Marcel Dekker, Inc., New York, 1998.

The Guangzhou International Symposium on Computational Mathematics was held at Zhongshan University, Guangzhou, People's Republic of China, in 1997. Reporting on topics ranging from numerical linear algebra to signal and image processing, this book addresses computational approximation, numerical solutions of differential and integral equations, inverse and ill-posed problems, and geometric modeling; presents a new class of Jacobi polynomials orthogonal with respect to certain varying weights; applies eigenstate preserving schemes to center manifolds and Hopf and torus bifurcations; constructs cubature formulas for the unit sphere in $\mathbf{R}^n$ that have almost equal weights.

P.G. CIARLET, J.L. LIONS. — **Handbook of numerical analysis, vol. 6: Numerical methods for solids (part 3), Numerical methods for fluids (part 1).** — Un vol. relié, 17,5×24,5, de X, 689 p. — ISBN 0-444-82569-X. — Prix: Dfl. 285.00. — Elsevier, Amsterdam, 1998.

This series of volumes covers all the major aspects of numerical analysis, serving as the basic reference work on the subject. Each volume concentrates on one to three particular topics.

Each article, written by an expert, is an in-depth survey, reflecting the most recent trends in the field, and is essentially self-contained. The handbook will cover the basic methods of numerical analysis, under the following general headings: Solution of equations in $\mathbf{R}^n$, finite difference methods, finite element methods, techniques of scientific computing, optimization theory and systems science. It also covers the numerical solution of actual problems of contemporary interest in applied mathematics, under the following headings: Numerical methods for fluids, numerical methods for solids, specific applications including meteorology, seismology, petroleum mechanics and celestial mechanics. *Contents of vol. 6: Numerical Methods for Solids (part 3):* R.M. Ferencz, T.J.R. Hughes: Iterative finite element solutions in nonlinear solid mechanics. — Obituary - Juan Carlos Simo. — J.C. Simo: Numerical analysis and simulation of plasticity. — *Numerical Methods for Fluids (part 1):* M. Marion, R. Temam: Navier-Stokes equations: theory and approximation.

Patrick DEWILDE and Alle-Jan VAN DER VEEN. — **Time-varying systems and computations.** — Un vol. relié, 16,5×24,5, de XIII, 459 p. — ISBN 0-7923-8189-0. — Prix: Dfl. 280.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book provides a detailed and consistent exposition of a powerful unifying framework for the study of time-variant systems and the computational aspects and problems that arise in this context. While complex function theory and linear algebra provide much of the fundamental mathematics needed by engineers engaged in numerical computations, signal processing and/or control, there has long been a large, abstruse gap between the two fields. This book shows the reader how the gap between analysis and linear algebra can be bridged. The authors explore, discover and exploit many interesting links that exist between classical linear algebraic concepts and complex analysis.

Neil GERSHENFELD. — **The nature of mathematical modeling.** — Un vol. relié, 18×25,5, de X, 344 p. — ISBN 0-521-57095-6. — Prix: £24.95. — Cambridge University Press, Cambridge, 1998.

This is a book about the nature of mathematical modeling, and about the kinds of techniques that are useful for modeling (both natural and otherwise). It is oriented towards simple efficient implementations on computers. The first part of the book covers exact and approximate analytical techniques (ordinary differential and difference equations, partial differential equations, variational principles, stochastic processes). The second part covers numerical methods (finite differences for ODEs and PDEs, finite elements, cellular automata). The third part covers model inference based on observations (function fitting, data transforms, network architectures, search techniques, density estimation, filtering and state estimation, linear and nonlinear time series). The text is completed by a Website and extensive worked problems that introduce extensions and applications.

Michel RAPPAZ, Michel BELLET, Michel DEVILLE. — **Modélisation numérique en science et génie des matériaux.** — Traité des matériaux, vol. 10. — Un vol. relié, 17×24,5, de XIII, 551 p. — ISBN 2-88074-365-6. — Prix: SFr. 108.00. — Presses polytechniques et universitaires romandes, Lausanne, 1998.

Cet ouvrage présente les notions nécessaires à la modélisation des phénomènes complexes ayant lieu lors de l'élaboration et de la mise en œuvre des matériaux. Après un bref rappel des équations de conservation et d'état à la base de ce domaine, les auteurs introduisent les principales méthodes numériques: différences finies, volumes finis et éléments finis. Ces techniques sont illustrées dans les chapitres du livre portant sur les problèmes de transformation de phase, de déformation des solides et d'écoulement des liquides. Les derniers chapitres traitent des

méthodes utiles dans la détermination des conditions aux limites ou des propriétés des matériaux, ainsi que des méthodes stochastiques utiles à la simulation de microstructures. Les diverses méthodes de modélisation sont présentées dans ce livre dans la perspective de l'ingénieur, limitant les développements mathématiques au strict nécessaire.

Informatique

Bernhard BAUER, Riitta HÖLLERER. — **Übersetzung objektorientierter Programmiersprachen: Konzepte, abstrakte Maschinen und Praktikum „Java-Compiler".** — Un vol. broché, 15,5×23,5, de XIV, 287 p. — ISBN 3-540-64256-0. — Prix: DM 49.90. — Springer, Berlin, 1998.

Dieses Buch vermittelt sowohl Studierenden der Informatik als auch Softwareentwicklern fundierte Grundlagen und Vorgehensweisen zur Entwicklung von Compilern für objektorientierte Programmiersprachen. Anhand mehrerer Sprachen (Smalltalk-80, Java, C++) werden die Konzepte objektorientierter Sprachen und ihrer Übersetzung dargestellt. Im Praxisteil des Buches wird die Spezifikation eines Übersetzers für Java entwickelt. Diese Spezifikation kann als Eingabe für einen Übersetzergenerator verwendet werden, der daraus ein ablauffähiges C-Programm erzeugt. Zahlreiche Illustrationen und Beispiele veranschaulichen die Lerninhalte. Durch das Praktikum im zweiten Teil mit Aufgaben und Lösungen (im WWW) kann der vermittelte Stoff am Beispiel eines Java-Compilers eingeübt werden.

Manfred BROY. — **Informatik: eine grundlegende Einführung, Bd. 2: Systemstrukturen und theoretische Informatik.** — 2. überarbeitete Auflage. — Springer-Lehrbuch. — Un vol. broché, 15,5×23,5, de XI, 404 p. — ISBN 3-540-64392-3. — Prix: DM 59.00. — Springer, Berlin, 1998.

Diese in der Neuauflage zweibändige Einführung behandelt die fundamentalen Modelle, Formalismen und sprachlichen Konstruktionen sowie die wichtigsten Anwendungsgebiete und technischen Konzeptionen der Informatik. *Inhaltsverzeichnis:* Prozesse, Kommunikation und Koordination in verteilten Systemen. — Betriebssysteme und Systemprogrammierung. — Interpretation und Übersetzung von Programmen. — Formale Sprachen. — Berechenbarkeit. — Komplexitätstheorie. — Effiziente Algorithmen und Datenstrukturen. — Beschreibungstechniken in der Programmierung. — Abschliessende Bemerkungen zur Informatik.

Henk J. A. M. HEIJMANS, Jos B. T. M. ROERDINK, (Editors). — **Mathematical morphology and its applications to image and signal processing.** — Computational imaging and vision, vol. 12. — Un vol. relié, 16,5×24,5, de IX, 442 p. — ISBN 0-7923-5133-9. — Prix: Dfl. 360.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book contains the proceedings of the International Symposium on Mathematical Morphology and its Applications to Image and Signal Processing IV, held June 3-5, 1998, in Amsterdam, The Netherlands. The purpose of the work is to provide the image analysis community with a sampling of recent developments in theoretical and practical aspects of mathematical morphology and its applications to image and signal processing. Among the areas covered are: digitization and connectivity, skeletonization, multivariate morphology, morphological segmentation, color image processing, filter design, gray-scale morphology, fuzzy morphology, decomposition of morphological operators, random sets and statistical inference, differential morphology and scale-space, morphological algorithms and applications.

Stephan KAUFMANN. — **Mathematica: kurz und bündig.** — Un vol. broché, 17×24, de 199 p. + 1 CD-ROM. — ISBN 3-7643-6008-9. — Prix: SFr. 42.00. — Birkhäuser Verlag, Basel, 1998.

Dieses Buch ist eine kompakte Einführung in das in der Mathematik sowie in den Natur- und Ingenieurwissenschaften weitverbreitete Programm *Mathematica*. Die für den Einstieg wesentlichen Aspekte der Version 3 (Front End, Kernel und wichtigste Standard-Pakete) werden mit einfachen, fachunabhängigen Beispielen erläutert und in Übungsaufgaben vertieft. Die beigefügte CD-ROM enthält das ganze Buch in Form von *Mathematica*-Notebooks mit farbigen Versionen der Grafiken und Animationen. In die Notebooks eingebaute Hyperlinks dienen internen Referenzen und verweisen auf die elektronische Dokumentation des Programms und auf Ressourcen im Internet. Die CD-ROM enhält das Programm *MathReader*, mit welchem die Notebooks auch ohne eine vollständige *Mathematica*-Installation betrachtet werden können.

Raymond SÉROUL, Silvio LEVY. — **TEX praxis.** — Un vol. broché, 17×24, de XIV, 425 p. — ISBN 3-7643-2823-1. — Prix: SFr. 58.00. — Birkhäuser Verlag, Basel, 1998.

Dieses Buch richtet sich sowohl an den Einsteiger als auch an den Anwender, der seine Kenntnisse vertiefen möchte. Es ist didaktisch hervorragend aufgebaut und enthält eine Vielzahl einfach nachzuvollziehender Beispiele. Als leicht verständliche Einführung in die Grundlagen von plain-TEX schliesst das Buch eine Lücke in der deutschsprachigen TEX-Literatur. Durch sein umfangreiches Glossar leistet es auch als Nachschlagewerk wertvolle Dienste.

J.F. TRAUB, A.G. WERSCHULZ. — **Complexity and information.** — Lezioni Lincee. — Un vol. broché, 13,5×21,5, de XII, 139 p. — ISBN 0-521-48506-1. — Prix: £12.95 (relié: £35.00). — Cambridge University Press, Cambridge, 1998.

The twin themes of computational complexity and information pervade this book. It starts with an introduction to information-based complexity, that is, the computational complexity of continuous mathematical models. It then moves to a variety of topics, including breaking the curse of dimensionality, complexity of path integration, solvability of ill-posed problems, value of information in computation, assigning values to mathematical hypotheses, and mathematical finance. The style is informal, and the goal is motivation and insight. Precise statements and proofs can be found in the monographs and papers included in the comprehensive bibliography.

Mécanique des fluides, acoustique

V.K. ANDREEV, O.V. KAPTSOV, V.V. PUKHNACHOV, A.A. RODIONOV. — **Applications of group-theoretical methods in hydrodynamics.** — Mathematics and its applications, vol. 450. — Un vol. relié, 17×25, de XII, 396 p. — ISBN 0-7923-5215-7. — Prix: Dfl. 380.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book presents applications of group analysis of differential equations to various models used in hydrodynamics. It contains many new examples of exact solutions to the boundary value problems for the Euler and Navier-Stokes equations. These solutions describe vortex structures in an inviscid fluid, Marangoni boundary layers, thermal gravity convection and other interesting effects. Moreover, the book provides a new method for finding solutions of nonlinear partial differential equations, which is illustrated by a number of examples, including equations for flows of a compressible ideal fluid in two and three dimensions. The work is reasonably self-contained and supplemented by examples of direct physical importance.

Mécanique quantique

G. KALMBACH. — **Quantum measures and spaces.** — Mathematics and its applications, vol. 153. — Un vol. relié, 16,5×24,5, de XI, 343 p. — ISBN 0-7923-5288-2. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1998.

Noncommutative measure theory is the theme of the first part of the book. The relevant quantum structures are algebraically introduced. This is then used in the axiomatic, geometric model discussed in the second part of the book, where old and partly new groups and finite-dimensional **R**, **C**, **H**-spaces or spheres are studied for particle-series, a bag and the four basic interactions of physics. The third part investigates infinite dimensional spaces, particularly Archimedean and non-Archimedean orthomodular spaces, which generalize classical Herbert spaces. The last part of the book contains short reviews on related topics which are useful to have at hand.

Economie, recherche opérationnelle, jeux

Jean-Pierre CROUZEIX, Juan-Enrique MARTINEZ-LEGAZ, Michel VOLLE, (Editors). — **Generalized convexity, generalized monotonicity: recent results.** — Nonconvex optimization and its applications, vol. 27. — Un vol. relié, 17×25, de XV, 467 p. — ISBN 0-7923-5088-X. — Prix: Dfl. 385.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The geometrical structure induced by convexity in mathematical programming induces a lot of nice properties: continuity and differentiability of the functions, separability and optimality conditions, duality, sensibility of the optimal solutions, etc. Several among the most interesting ones are preserved when convexity is relaxed in quasiconvexity or pseudoconvexity (a function is quasiconvex if its lower set levels are convex). This is still the case for variational inequality problems when the classical monotonicity assumption on the map is relaxed in quasimonotonicity or pseudomonotonicity. This volume contains 23 selected lectures presented at the last International Symposium on Generalized Convexity. It provides an up-to-date review of recent developments.

George B. DANTZIG. — **Linear programming and extensions.** — Princeton landmarks in mathematics and physics. — Un vol. broché, 15,5×23,5, de XVI, 627 p. — ISBN 0-691-05913-6. — Prix: US$29.95. — Princeton University Press, Princeton, 1993.

In real-world problems related to finance, business, and management, mathematicians and economists frequently encounter optimization problems. In this classic book, the author looks at a wealth of examples and develops linear programming methods for their solutions. He begins by introducing the basic theory of linear inequalities and describes the powerful simplex method used to solve them. Treatments of the price concept, the transportation problem, and matrix methods are also given, and key mathematical concepts such as the properties of convex sets and linear vector spaces are covered.

Mark M. MEERSCHAERT. — **Mathematical modeling.** — Second edition. — Un vol. relié, 16,5×23,5, de XVI, 351 p. — ISBN 0-12-487652-8. — Prix: US$49.95. — Academic Press, San Diego, CA, 1999.

The second edition of this text offers a unique approach to mathematical modeling. The author offers an inviting introduction and applies a problem-solving methodology in three major areas of optimization, dynamical systems, and stochastic processes. *Key features include:* A large collection of real-world problems. — An integration of computer outputs from the latest

version of Mathematica®, Maple®, MINITAB®, Lindo®. — A systematic five-step modeling method. — Applying calculus, differential equations, linear algebra, and probability. — *New to this edition:* Material on discrete modeling, including integer programming. — Extended treatment of chaos and fractals. — Additional material on linear programming, including the use of spreadsheet tools. — More applications in probability and statistics.

Jiři OUTRATA, Michal KOCVARA, Jochem ZOWE. — **Nonsmooth approach to optimization problems with equilibrium constraints: theory, applications and numerical results.** — Nonconvex optimization and its applications, vol. 28. — Un vol. relié, 17×25, de XXI, 273 p. — ISBN 0-7923-5170-3. — Prix: Dfl. 240.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The book begins with a chapter on auxiliary results followed by a description of the main numerical tools: a bundle method of nonsmooth optimization and a nonsmooth variant of Newton's method. Following this, stability and sensitivity theory for generalized equations is presented, based on the concept of strong regularity. This enables to apply the generalized differential calculus for Lipschitz maps to derive optimality conditions and to arrive at a solution method. A large part of the book focuses on applications coming from continuum mechanics and mathematical economy. A series of nonacademic problems is introduced and analyzed in detail. Each problem is accompanied with examples that show the efficiency of the solution method.

Richard J. NOWAKOWSKI, (Editor). — **Games of no chance: combinatorial games at MSRI, 1994.** — Mathematical Sciences Research Institute publications, vol. 29. — Un vol. broché, 16×23.5, de XIII, 537 p. — ISBN 0-521-57411-0. — Prix: £40.00. — Cambridge University Press, Cambridge, 1998.

This volume represents a significant addition to the literature of combinatorial games. The first part will be accessible to anyone, regardless of background: it contains introductory expositions, reports of unusual tournaments, and an article by Conway on the possibly everlasting contest between an angel and a devil. Next come studies of chess and from the point of view of combinatorial game theory: reports on computer advances such as the solution of nine-men morris and pentominoes: and new theoretical approaches, including extensions of the traditional framework to games with many players, or lacking perfect information, or involving loops. The book closes with an annotated list of unsolved problems and a comprehensive bibliography.

Jack ROBERTSON, William WEBB. — **Cake-cutting algorithms: be fair if you can.** — Un vol. relié, 16×23.5, de X, 181 p. — ISBN 1-65881-076-8. — Prix: US$38.00. — A.K. Peters, Natick, Massachusetts, 1998.

This book offers a complete treatment of cake-cutting algorithms under all the considered definitions of "fair", and presents them in a coherent, reader-friendly manner. The first seven chapters take a more leisurely and conversational look at the problem; written with the novice in mind, they show the problem's inherent beauty, unhindered by intensive mathematical formalism. The final four chapters are for the non-casual reader and contain technical details of proofs not suited for the first section.

Roman SLOWINSKI, (EDITOR). — **Fuzzy sets in decision analysis, operations research and statistics.** — The Handbooks of fuzzy sets series. — Un vol. relié, XXIV, 453 p. — ISBN 0-7923-8112-2. — Prix: Dfl. 385.00. — Kluwer Academic Publishers, Dordrecht, 1998.

P. Perny, M. Roubens: Fuzzy preference modeling. — M. Grabisch, S.A. Orlovski, R.R. Yager: Fuzzy aggregation of numerical preferences. — J. Fodor, S.A. Orlovski, P. Perny, M. Roubens: The use of fuzzy preference models in multiple criteria choice, ranking and

sorting. — J. Kacprzyk, H. Nurmi: Group decision making under fuzziness. — A. Billot: Elements of fuzzy game theory. — H. Rommelfanger, R. Slowinski: Fuzzy linear programming with single or multiple objective functions. — M. Sakawa: Fuzzy nonlinear programming with single or multiple objective functions. — S. Chanas, D. Kuchta: Discrete fuzzy optimization. — A.O. Esogbue, J. Kacprzyk: Fuzzy dynamic programming. — J. Gebhardt, M. A. Gil, R. Kruse: Fuzzy set-theoretic methods in statistics. — P. Diamond, H. Tanaka: Fuzzy regression analysis. — E. Kerre, T. Onisawa, B. Cappelle, I. Gazdik: Reliability. — A.O. Esogbue, W.E. Hearnes II: Maintenance and replacement models under a fuzzy framework.

Biologie et sciences du comportement

D.J. Daley and J. Gani. — **Epidemic modelling: an introduction.** — Cambridge studies in mathematical biology, vol. 15. — Un vol. relié, 15,5×23,5, de xii, 213 p. — ISBN 0-521-64079-2. — Prix: £30.00. — Cambridge, Cambridge University Press, 1999.

This is the general introduction to the ideas and techniques required to understand the mathematical modelling of diseases. It begins with an historical outline of some disease statistics dating from Daniel Bernoulli's smallpox data of 1760. The authors then describe simple deterministic and stochastic models in continuous and discrete time for epidemics taking place in either homogeneous or stratified (nonhomogeneous) populations. A range of techniques for constructing and analysing models is provided, mostly in the context of viral and bacterial diseases of human population. Questions of fitting data to models, and the use of models in understanding methods for controlling the spread of infection are discussed.

Systèmes, contrôle optimal

Arik A. Melikyan. — **Generalized characteristics of first order PDEs: applications in optimal control and differential games.** — Un vol. relié, 16,5×24, de xiv, 310 p. — ISBN 0-8176-3984-5. — Prix: SFr. 148.00. — Birkhäuser Verlag, Basel, 1998.

First-order PDEs possess two types of characteristics: regular (classical) and singular. It is proved that singular surfaces, generally, can be constructed using singular characteristics (SC). Both regular and singular characteristics allow the solution to the PDE to be constructed. The technique developed is called the method of singular characteristics (MSC). A classification of SC is suggested and the corresponding ODE-systems are derived. The MSC is applied to several problems in control and game theory to solve the so-called HJB-equation. Singular paths are investigated in differential games on a Riemannian manifold with nonunique shortest geodesics connecting two points; complete solutions are constructed for games on two-dimensional cones.